

# Systematical and phytogeographical analysis of the flora on Mt Golo Bardo

Nadezhda Apostolova-Stoyanova<sup>1</sup> & Stoyan Stoyanov<sup>2</sup>

<sup>1</sup> University of Forestry, 10 Kliment Ohridski St., 1756 Sofia, Bulgaria, e-mail: apostolova\_nadejda@abv.bg

<sup>2</sup> Institute of Botany, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: stoyanov@bio.bas.bg

Received: November 09, 2009 ▷ Accepted: November 16, 2009

**Abstract.** The article presents the contemporary status of the flora and the phytogeographical characteristics of the mountain and comprises: a floristic list of the vascular plants, including mosses; distribution of the flora on the principle of systematics, by biological type and by origin, and by floristic elements; analysis of the participation of rare, threatened, protected, relict and endemic species. Seven hundred and twenty-four species (without mosses) have been identified in Mt Golo Bardo, belonging to 358 genera and 77 families. They account for 18.1% of all species in Bulgaria, 40.3% of the genera, and 52.4% of the families. Twenty-nine moss species were registered too (4.1% of all species in Bulgaria), distributed between 22 genera (10.6%), 15 families (19.0%). The biological spectrum resembles the spectrums of two vegetation types: forests in the temperate cold zone and dry grassy communities with prevalence of the gramineous. Hemicryptophytes prevailed in quantity (59%), followed by therophytes (18%) and phanerophytes (10%). Three classification systems have been used for the phytogeographical analysis – of Assyov & Petrova, of Gajić and of Stefanov – all showing similar results. Distribution of the floristic elements according to the classification of Assyov & Petrova has shown the strongest presence of the Submediterranean elements (16.4%), Euro-Mediterranean (14.5%) and Eurasian (13.0%) and according to the classification of Gajić – Subcentral European (12.8%), Eurasian (11.5%) and Submediterranean (10.8%). According to the classification of Stefanov the species of the Mountain Centre accounted for the largest share of stationary elements in the mountain (55.0%), those of the Northern Continental Centre participated with the highest number of mobile elements (34.4%), and those of the Southern Continental Centre were most important among the elements of secondary penetration in Bulgarian (69.5%). On Mt Golo Bardo has been found 28 Balkan (3.9%) and three Bulgarian (0.4%) endemic elements. Twenty-five relict elements were registered (3.5% of the species composition). Sixty-six species have been found to require a conservation status (9.1% of the species in Mt Golo Bardo).

**Key words:** Bulgaria, chorology, flora, life forms, Mt Golo Bardo, vascular plants

---

## Introduction

Mt Golo Bardo is characteristic with its ample plant diversity, part of which is protected in the Ostritsa Managed Reserve (MR). The flora and vegetation of Golo Bardo and especially of Ostritsa MR have been object of research by Bulgarian and foreign botanists, such as Urumov (1935), Stoyanov & Achtarov (1951), Jakucs (1961), Stanev (1965), Vichodtsevski (1968), Vasilev

(1973, 1981), Vassilev & Andreev (1978, 1983, 1992), Pavlov & Dimitrov (2002, 2004), Apostolova-Stoyanova & al. (2005). The floristic interest in the mountain has been stepped up by the identifications of that region as important for the speciation processes and enrichment of the genetic fund of the Bulgarian flora (Vassilev & Andreev 1978).

During the various investigations of the flora of Ostritsa MR, between 350 and 450 vascular species

(without mosses) have been approximately established (Vasilev & Andreev 1978; Vasilev 1981; Pavlov & Dimitrov 2002). The number of vascular species (without mosses) on the territory of the entire mountain varies in the different studies, starting with 500 reported by Urumov (1935) and, after some species added by Stanev (1965), Vasilev (1973) reached 670 species reported by Vasilev & Andreev (1983, 1992). More detailed researches of the flora of Mt Golo Bardo and Ostritsa MR were carried out by Vasilev (1981), Vasilev & Andreev (1978, 1981, 1983, 1992) and Pavlov & Dimitrov (2002). In their studies they analysed the biological and chorological spectrum, participation of the endemics and relicts, of plants protected by Bulgarian legislation, of species covered by various Conventions, and of the ecological plant groups. All above-mentioned studies have found great floristic diversity; presence of rare, endemic, threatened, protected and relict species; strong participation of southern and steppe species owing to the dry and warm calcareous terrains. Almost all publications about the flora of Mt Golo Bardo and Ostritsa MR did not contain lists of the identified plant species. Pavlov & Dimitrov (2002) were the first to attach to their article a floristic list of Ostritsa MR.

The present study aims to identify the floristic composition of Mt Golo Bardo, including mosses, which have not been studied so far; and to present a systematic and phytogeographical analysis of the flora and comparison with the results of the earlier studies.

## Object and methods

Mt Golo Bardo rises between the valleys of Pernik and Radomir, in the northwest it reaches the Batanovski Gorge of river Struma, and in the southeast is linked with Mt Verila.

Mt Golo Bardo is a well differentiated massive, oblong in shape, about 20 km long and 5 km wide. The mountain curves in the middle so that its western part has a west-east orientation and the rest stretches in the northwest-southeast direction. The average altitude is 900–1000 m, which refers it to the low mountains of Bulgaria. Mt Golo Bardo is characteristically symmetric in profile. The central crest is rounded and distinct; it is higher in its western part, which houses the peaks Vetrushka (1158 m), Ostritsa (1147 m) and Primochlyak (1154 m) (Nikolov & Jordanova 2002).

Mt Golo Bardo falls into the Temperate Continental Climatic Region (Valev 2002). The continental character of the climate is expressed in a warm summer and cold winter, great amplitudes in air temperatures, spring-summer maximum and winter minimum of precipitation, and annual, relatively sustainable snow cover.

According to the accepted hydrological regioning of Bulgaria (Jordanova 2002), Mt Golo Bardo falls into the Hydrological Zone B, with its temperate continental climatic influence of the outflow; the Hydrological Subzone BII, with considerable snow feeding of the outflow; and the Hydrological Region BII3. The mountain is drained out by river Struma, which encircles it from the east, north and west. All water streams on the territory of Mt Golo Bardo are of temporary character. They are full early in spring, owing to the rapid thawing of the snow cover. In the rest of the year the gullies running down from the mountain crests are dry, owing to the rather sparse rainfalls, strong evaporation and quick draining away down the calcareous slopes.

The geological base of Mt Golo Bardo constitutes of sedimental rocks. Triassic limestones, dolomites and marls prevail, and sandstones and conglomerates are revealed at the foot of the mountain. The calcareous rock composition is one of the most typical specificities of Mt Golo Bardo and a major factor for the existing ecological conditions. The mountain is deeply karsted, bare and dry.

The combination of continental climate with Mediterranean influence, of calcareous base rock and low-mountain relief has led to formation of *Rendzina* soils (humus-carbonate) of the *Leptosols* class (Donov 1993). With such soils the hummus horizon is characteristically situated immediately above the primary unconsolidated materials (AC profile). These soils are sandy-clayey up to slightly clayey, dark-grey in colour. The soil is insufficiently humid (dry to fresh), owing to the fast seep-down of water to a great depth. Soil susceptibility to erosion is a grave problem.

According to the geobotanic regioning of Bulgaria (Bondev 2002), the vegetation of Mt Golo Bardo is referred to the Holarctic Kingdom, European Deciduous Forest Zone, Illyrian (Balkan) Province, Sofia District, Graovo-Cherna Gora Region. Mesophyte riverine forest and grassy vegetation, as well as xerothermic forest, shrub and grassy vegetation occur in the mountain.

The floristic analysis was carried out in accordance to the methods of Tolmachev (1974). The number of taxa was assessed by categories, as well as the relative

participation of taxa from different ranks in the studied flora, as compared to their general number in the floras of Bulgaria and of Mt Golo Bardo, and the richest in species families and genera. The biological spectrum of the flora was determined by the life forms according to Raunkiaer (1934). The chorological spectrum was established by using the data for floristic elements according to Assyov & Petrova (2006), Gajić (1980, 1984) and Stefanov (1943) and for the bryoflora according to Boros (1968). The participation of endemics and relict elements was assessed (Gajić 1980, 1984), as well of the taxa with conservation status.

The floristic composition was established by means of field studies in the period 2004–2009. Species registered in Mt Golo Bardo by other authors, but not identified with this investigation, are not included in the present article. The floristic list was arranged alphabetically by family names, within the framework of the respective classes and divisions (Supplement 1). The number and distribution of the taxa (without mosses) by categories was based according to Jordanov (1963–1979), Velchev (1982, 1989), Kozuharov (1992, 1995), Delipavlov & Cheshmedzhiev (2003), and Assyov & Petrova (2006). For the purpose of determination and nomenclature of mosses the authors used Petrov (1975), Ganeva & Natcheva (2003), and Natcheva & Ganeva (2005).

## Results and discussion

The present study has established 724 vascular species (without mosses), belonging to 358 genera and 77 families (Supplement 1). They account for 18.1 % of all species in Bulgaria, 40.3 % of the genera, and 52.4 % of the families. Their relative participation has been cal-

culated on the basis of 3997 species, 889 genera and 147 families identified in the Bulgarian flora (Assyov & Petrova 2006). Twenty-nine moss species were registered too, distributed between 22 genera, 15 families and two classes (Supplement 1). They account for 4.1 % of all species in Bulgaria, 10.6 % of the genera, and 19.0 % of the families. In order to make the data comparable with those from earlier studies, the mosses were not included in the floristic analysis.

In the distribution of vascular taxa within the flora of Mt Golo Bardo (Table 1), the strongest participation went to *Magnoliopsida*, represented by 63 families (81.8 % of the total number of families in the territory studied, 282 genera (78.8 % of the total number of genera) and 582 species (80.4 % of the total number of species). *Liliopsida* is represented by eight families (10.4 %), 70 genera (19.6 %) and 133 species (18.4 %), *Pinopsida* participated with two families (2.6 %), two genera (0.6 %) and four species (0.6 %), *Polypodiopsida* with three families (3.9 %), three genera (0.8 %) and four species (0.6 %), and *Equisetopsida* with one family (1.3 %), one genus (0.3 %) and one species (0.1 %).

Participation of the genera in the different families, as compared to their total number in the flora of the mountain (358), varied between 0.3 % и 11.2 %, and the participation of the species in the different families (724), varied between 0.1 % and 11.9 % (Table 2).

The Bulgarian flora is represented in Mt Golo Bardo as a correlation within the framework of the higher and lower taxa in Table 1 and 2. *Equisetopsida* participated with 100 % of the Bulgarian families and genera and with 12.5 % of the species, *Polypodiopsida* at family level with 16.7 % of those reported for Bulgaria, at genus level with 11.1 % and at species level with 6.6 %. The established participation of *Pinopsida* claimed 50 % of

**Table 1.** Taxonomic structure of the flora of Mt Golo Bardo.

taxonomic category	<i>Equisetophyta</i>				<i>Polypodiophyta</i>				<i>Pinophyta</i>				<i>Magnoliophyta</i>							
	<i>Equisetopsida</i>				<i>Polypodiopsida</i>				<i>Pinopsida</i>				<i>Magnoliopsida</i>				<i>Liliopsida</i>			
	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo
Families	1	1	100.0	1.3	18	3	16.7	3.9	4	2	50.0	2.6	107	63	58.9	81.8	17	8	47.1	10.4
Genera	1	1	100.0	0.3	27	3	11.1	0.8	6	2	33.3	0.6	663	282	42.5	78.8	192	70	36.5	19.6
Species	8	1	12.5	0.1	61	4	6.6	0.6	17	4	23.5	0.6	3188	582	18.3	80.4	723	133	18.4	18.4

**Table 2.** Distribution of the species and genera according to the families and their relative participation in the floras of Mt Golo Bardo and Bulgaria.

Families	Genera				Genera			
	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo (358)	Number of taxa in Bulgaria	Number of taxa in Mt Golo Bardo	% of the total number of taxa in Bulgaria	% of the total number of taxa in Mt Golo Bardo (724)
1	2	3	4	5	6	7	8	9
<i>Equisetaceae</i>	1	1	100.0	0.3	8	1	12.5	0.1
<i>Aspleniaceae</i>	3	1	33.3	0.3	11	2	18.2	0.3
<i>Athyriaceae</i>	2	1	50.0	0.3	4	1	25.0	0.1
<i>Hypolepidaceae</i>	1	1	100.0	0.3	1	1	100.0	0.1
<i>Cupressaceae</i>	1	1	100.0	0.3	6	2	33.3	0.3
<i>Pinaceae</i>	3	1	33.3	0.3	8	2	25.0	0.3
<i>Acanthaceae</i>	1	1	100.0	0.3	2	1	50.0	0.1
<i>Aceraceae</i>	1	1	100.0	0.3	7	4	57.1	0.6
<i>Anacardiaceae</i>	3	1	33.3	0.3	3	1	33.3	0.1
<i>Apiaceae</i>	62	22	35.5	6.1	143	35	24.5	4.8
<i>Apocynaceae</i>	2	1	50.0	0.3	4	1	25.0	0.1
<i>Araliaceae</i>	1	1	100.0	0.3	1	1	100.0	0.1
<i>Aristolochiaceae</i>	2	2	100.0	0.6	5	2	40.0	0.3
<i>Asclepiadaceae</i>	5	1	20.0	0.3	7	1	14.3	0.1
<i>Asteraceae</i>	86	40	46.5	11.2	506	86	17.0	11.9
<i>Berberidaceae</i>	3	1	33.3	0.3	3	1	33.3	0.1
<i>Betulaceae</i>	5	4	80.0	1.1	9	6	66.7	0.8
<i>Boraginaceae</i>	21	10	47.6	2.8	78	16	20.5	2.2
<i>Brassicaceae</i>	57	14	24.6	3.9	188	22	11.7	3.0
<i>Campanulaceae</i>	8	4	50.0	1.1	45	10	22.2	1.4
<i>Cannabaceae</i>	2	1	50.0	0.3	2	1	50.0	0.1
<i>Caprifoliaceae</i>	3	3	100.0	0.8	9	3	33.3	0.4
<i>Caryophyllaceae</i>	30	16	53.3	4.5	191	32	16.8	4.4
<i>Celastraceae</i>	1	1	100.0	0.3	3	2	66.7	0.3
<i>Chenopodiaceae</i>	14	1	7.1	0.3	43	1	2.3	0.1
<i>Cistaceae</i>	5	3	60.0	0.8	12	3	25.0	0.4
<i>Convolvulaceae</i>	3	2	66.7	0.6	12	3	25.0	0.4
<i>Cornaceae</i>	1	1	100.0	0.3	2	2	100.0	0.3
<i>Crassulaceae</i>	6	1	16.7	0.3	31	5	16.1	0.7
<i>Dipsacaceae</i>	7	5	71.4	1.4	35	12	34.3	1.7
<i>Euphorbiaceae</i>	5	2	40.0	0.6	35	12	34.3	1.7
<i>Fabaceae</i>	40	19	47.5	5.3	287	63	22.0	8.7
<i>Fagaceae</i>	3	2	66.7	0.6	18	4	22.2	0.6
<i>Gentianaceae</i>	5	2	40.0	0.6	26	2	7.7	0.3
<i>Geraniaceae</i>	2	2	100.0	0.6	29	10	34.5	1.4
<i>Globulariaceae</i>	1	1	100.0	0.3	3	1	33.3	0.1
<i>Hypericaceae</i>	1	1	100.0	0.3	22	5	22.7	0.7
<i>Juglandaceae</i>	1	1	100.0	0.3	1	1	100.0	0.1
<i>Lamiaceae</i>	30	26	86.7	7.3	145	49	33.8	6.8

**Table 2.** Continuation

	1	2	3	4	5	6	7	8	9
<i>Linaceae</i>	2	1	50.0	0.3	20	7	35.0	1.0	
<i>Lythraceae</i>	4	1	25.0	0.3	10	1	10.0	0.1	
<i>Malvaceae</i>	7	4	57.1	1.1	17	4	23.5	0.6	
<i>Monotropaceae</i>	1	1	100.0	0.3	1	1	100.0	0.1	
<i>Oleaceae</i>	5	3	60.0	0.8	8	4	50.0	0.6	
<i>Onagraceae</i>	4	1	25.0	0.3	20	5	25.0	0.7	
<i>Orobanchaceae</i>	1	1	100.0	0.3	26	2	7.7	0.3	
<i>Papaveraceae</i>	7	4	57.1	1.1	31	6	19.4	0.8	
<i>Plantaginaceae</i>	1	1	100.0	0.3	15	5	33.3	0.7	
<i>Polygalaceae</i>	1	1	100.0	0.3	15	2	13.3	0.3	
<i>Polygonaceae</i>	9	3	33.3	0.8	41	5	12.2	0.7	
<i>Primulaceae</i>	10	3	30.0	0.8	30	4	13.3	0.6	
<i>Ranunculaceae</i>	20	12	60.0	3.4	113	22	19.5	3.0	
<i>Resedaceae</i>	1	1	100.0	0.3	3	1	33.3	0.1	
<i>Rhamnaceae</i>	4	1	25.0	0.3	9	2	22.2	0.3	
<i>Rosaceae</i>	28	18	64.3	5.0	233	37	15.9	5.1	
<i>Rubiaceae</i>	6	5	83.3	1.4	60	19	31.7	2.6	
<i>Rutaceae</i>	3	2	66.7	0.6	5	2	40.0	0.3	
<i>Salicaceae</i>	2	2	100.0	0.6	23	2	8.7	0.3	
<i>Santalaceae</i>	3	2	66.7	0.6	13	4	30.8	0.6	
<i>Saxifragaceae</i>	4	1	25.0	0.3	30	1	3.3	0.1	
<i>Scrophulariaceae</i>	24	11	45.8	3.1	160	29	18.1	4.0	
<i>Staphyleaceae</i>	1	1	100.0	0.3	1	1	100.0	0.1	
<i>Thymelaeaceae</i>	2	2	100.0	0.6	9	2	22.2	0.3	
<i>Tiliaceae</i>	1	1	100.0	0.3	4	2	50.0	0.3	
<i>Ulmaceae</i>	2	1	50.0	0.3	5	2	40.0	0.3	
<i>Urticaceae</i>	2	2	100.0	0.6	8	2	25.0	0.3	
<i>Valerianaceae</i>	3	1	33.3	0.3	21	1	4.8	0.1	
<i>Verbenaceae</i>	2	1	50.0	0.3	3	1	33.3	0.1	
<i>Violaceae</i>	1	1	100.0	0.3	35	8	22.9	1.1	
<i>Amoryllidaceae</i>	5	2	40.0	0.6	5	2	40.0	0.3	
<i>Araceae</i>	3	1	33.3	0.3	4	1	25.0	0.1	
<i>Cyperaceae</i>	19	1	5.3	0.3	105	11	10.5	1.5	
<i>Iridaceae</i>	4	3	75.0	0.8	25	8	32.0	1.1	
<i>Juncaceae</i>	2	2	100.0	0.6	33	3	9.1	0.4	
<i>Liliaceae</i>	25	17	68.0	4.7	115	34	29.6	4.7	
<i>Orchidaceae</i>	25	10	40.0	2.8	56	18	32.1	2.5	
<i>Poaceae</i>	92	34	37.0	9.5	310	56	18.1	7.7	

the families registered in Bulgaria, 33.3% of the genera and 23.5% of the species. More than half of the families of *Magnoliopsida* in Bulgaria participated in the flora of Mt Golo Bardo (58.9%), with 42.5% as the share of the genera, while the species identified in the mountain amounted only to 18.3%. *Liliopsida* were represented somewhat similarly to the *Magnoliopsida* in Bulgaria: the participation of families was recorded as 47.1%, of the genera 36.5% and of the species 18.4%. Some of the

families identified in Golo Bardo were represented by 100% of the genera (*Equisetaceae*, *Cupressaceae*, *Aceraceae*, *Aristolochiaceae*, *Caprifoliaceae*, *Geraniaceae*, *Hypericaceae*, *Plantaginaceae*, *Tiliaceae*, *Violaceae*, *Juncaceae*, etc.). This was due to the fact that only one, two or three genera participated in the families mentioned for the flora of Bulgaria. Owing to the limited diversity of habitats in the mountain, a considerable part of the representatives of the larger families did not occur in Mt Golo Bardo, which led to a lower percentage participation of the genera in these families (below 50.0%) (*Borraginaceae* 47.6%, *Fabaceae* 47.5%, *Asteraceae* 46.5%, *Scrophulariaceae* 45.8%, *Orchidaceae* 40.0%, *Poaceae* 37.0%, *Apiaceae* 35.5%, and *Brassicaceae* 24.6%). Mention deserve here some of the large families which participated in the flora of the mountain with more than 50.0% of their genera (*Lamiaceae* 86.7%, *Liliaceae* 68.0%, *Rosaceae* 64.3%, *Ranunculaceae* 60.0%, *Caryophyllaceae* 53.3%). Percentage participation of the species in the different families, as compared to their total number in the Bulgarian flora, was similar to the percentage participation of the genera. Again, the fullest represented were the families with one of two species (*Hypolepidaceae*, *Cornaceae*, *Araliaceae*, *Staphyleaceae*, and *Monotropaceae*). The families rich in species showed partial representation of their species composition: below 40.0%. Families like *Apiaceae* and *Fabaceae* were represented by less than ¼ of their species; while *Ranunculaceae*, *Scrophulariaceae*, *Poaceae*, *Asteraceae*, *Caryophyllaceae*, *Rosaceae*, and *Brassicaceae* with less than 1/5 of their species. Of the larger families, only *Lamiaceae* and *Liliaceae* participated with species accounting approximately for 30% of the Bulgarian representatives for the reported families.

Similar distribution of the taxa from different categories and their relative participation, as compared to the Bulgarian flora in general and the flora of Mt Golo Bardo, was given in the study of Vasilev & Andreev (1992). There are some insignificant differences probably due, on the one hand, to the differences in the number of the identified taxa in the mountain – 69 families, 305 genera and 663 species and, on the other, to the difference in the number of the respective taxa for Bulgaria – 143 families, 861 genera and 3656 species. The difference in the number of the identified taxa cannot be discussed, because the above-mentioned authors have not attached a systematic list. The relative participation of the taxa in the flora of Ostritsa MR, as compared to their total number in the floras of Bulgaria and of Mt

Golo Bardo, studied by Vasilev & Andreev (1978, 1992) and by Pavlov & Dimitrov (2002), also showed similar results, which corroborates their claims of high representation in the flora of the reserve.

The leading families in the flora of Mt Golo Bardo coincided with those in the Bulgarian flora in general. Most abounding in species and genera were *Asteraceae* with 86 species and 40 genera, *Fabaceae* with 63 species and 19 genera, and *Poaceae* with 56 species and 34 genera (Table 3); the most numerous genera were *Centaurea* represented by 12 species, *Carex* with 11, *Euphorbia*, *Galium* and *Lathyrus* with 10 each, *Allium* with nine, *Astragalus*, *Bromus*, *Geranium*, *Veronica*, and *Viola* with eight each, *Linum*, *Orchis*, *Potentilla*, and *Trifolium* with seven each, *Bupleurum*, *Campanula*, *Hieracium*, *Inula*, *Poa*, *Ranunculus*, *Rosa*, *Salvia*, *Stachys*, and *Vicia* with six each, and *Epilobium*, *Hypericum*, *Medicago*, *Plantago*, *Sedum*, *Silene*, *Tragopogon*, and *Verbascum* with five species each (Supplement 1).

An analysis of the biological spectrum helped assess the specific conditions of development of the floristic complexes. On Mt Golo Bardo hemicryptophytes prevailed in quantity, followed by therophytes, phanerophytes, geophytes and chamaephytes (Table 4). The same distribution was established by Vasilev & Andreev (1992) and by Pavlov & Dimitrov (2002). It reminded of the biological spectrums of two vegetation types: forests in the temperate cold zone and dry grassy communities with prevalence of the *Poaceae*. Most plant species were hemicryptophytes (59%), which is characteristic of the temperate geographical latitudes and is typical of the biological spectrums of the two above-mentioned vegetation types. Among the remaining life forms, the annual plants (therophytes) (18%) stood out, which implied similarity with the biological spectrum of the dry grassy communities with prevalence of the *Poaceae* typical of the Mediterranean. Also, mention deserves the relatively strong participation of phanerophytes (10%), which is not characteristic of the dry grassy communities with prevalence of the *Poaceae*, but is typical of the forests in the temperate cold zone developing under a temperate continental climate. The resemblance of the biological spectrum of Mt Golo Bardo to the biological spectrums of the two vegetation types is explained by the geographical situation of the mountain lying in the temperate continental latitudes but with a palpable climatic influence of the Mediterranean. Resemblance to the dry grassy communities with prevalence of the grasses vegetation type was due to the typical of Mt Golo Bardo xerophyte and mesoxerophyte

grassy communities, with strong participation of therophytes. There are suitable places in the mountain for the development of mesophyte forests which, in turn, explains the similarity of the biological spectrum with that of the forests in the temperate cold zone.

Conformities of distribution and probable origin of plants were subject to the botanico-geographical analysis of the flora. Chorological spectrums were drawn on the basis of the data of Assyov & Petrova (2006), Gajić (1980, 1984) and Stefanov (1943), in order to obtain comparability with the data obtained during earlier studies, whose authors have used different classifications (Vasilev & Andreev 1983; Pavlov & Dimitrov 2002). A phytogeograph-

**Table 3.** Families with the greatest participation of species and genera in the flora of Mt Golo Bardo.

Families	Species		Genera	
	Number of taxa	% of the total number of taxa (724)	Number of taxa	% of the total number of taxa (358)
<i>Asteraceae</i>	86	11.9	40	11.2
<i>Fabaceae</i>	63	8.7	19	5.3
<i>Poaceae</i>	56	7.7	34	9.5
<i>Lamiaceae</i>	49	6.8	26	7.3
<i>Rosaceae</i>	37	5.1	18	5.0
<i>Apiaceae</i>	35	4.8	22	6.1
<i>Liliaceae</i>	34	4.7	17	4.7
<i>Caryophyllaceae</i>	32	4.4	16	4.5
<i>Scrophulariaceae</i>	29	4.0	11	3.1
<i>Brassicaceae</i>	22	3.0	14	3.9
<i>Ranunculaceae</i>	22	3.0	12	3.4
<i>Rubiaceae</i>	19	2.6	5	1.4
<i>Orchidaceae</i>	18	2.5	10	2.8
<i>Boraginaceae</i>	16	2.2	10	2.8
<i>Dipsacaceae</i>	12	1.7	5	1.4
<i>Euphorbiaceae</i>	12	1.7	2	0.6
<i>Cyperaceae</i>	11	1.5	1	0.3
<i>Campanulaceae</i>	10	1.4	4	1.1
<i>Geraniaceae</i>	10	1.4	2	0.6

**Table 4.** Biological spectrum of the flora of Mt Golo Bardo.

Vegetation type	Life-forms, %				
	Ph	Ch	H	G	Th
Mt Golo Bardo	10	4	59	9	18
Forests in the temperate cold zone	10	17	54	12	7
Dry grassy communities with prevalence of <i>Poaceae</i>	1	12	63	10	14

**Legend:** Ph – Phanerophytes; Ch – Chamaephytes; H – Hemicryptophytes; G – Geophytes; Th – Therophytes.

ical analysis of the bryoflora was made according to the classification of Boros (1968).

Cosmopolitan mosses and characteristic of northern part of the northern hemisphere prevailed in Mt Golo Bardo. Distribution of the floristic elements according to the classification of Boros (1968) (Table 5) has shown the strongest presence of Circumpolar (44.8%), followed by Circumpolar, nearly cosmopolitan (17.2%), Cosmopolitan (6.9%) and Nearly cosmopolitan (6.9%). The floristic elements Circumpolar with mediterranean-atlantic character, Circumpolar with mediterranean character and Mediterranean are unite in a group of the floristic element with Mediterranean-atlantic character, whose participation is calculated to 10,2%. Participation of the last floristic element is connected with Mediterranean climate influence and calcareous base rock.

The chorological spectrum based on the data of Assyov & Petrova (2006) has shown the strongest participation of the Submediterranean elements (16.4%), followed by the Euro-Mediterranean (14.5%) and Eurasian (13.0%) (Table 6). Considerable participation (8.3–4.0%) was also registered by the Euro-Siberian, European, Mediterranean, Pontic-Mediterranean, and Boreal floristic elements. This distribution means that on the mountain there exists a combination of such plant species which come and originate from geographical regions with great differences in the climatic conditions, irrespective of the fact that the diversity of habitats offered by the mountain is not very great. The temperate continental climate favours the growth of species typical of the

**Table 5.** Phytogeographical elements of the bryoflora of Mt Golo Bardo (according to Boros).

Chorological type	Number of taxa	% of the total number of taxa
Circumpolar	13	44.8
Circumpolar, nearly cosmopolitan	5	17.2
Cosmopolitan	2	6.9
Nearly cosmopolitan	2	6.9
Circumpolar with continental character	1	3.4
Circumpolar with mediterranean-atlantic character	1	3.4
Circumpolar with mediterranean character	1	3.4
Circumpolar/ Continental	1	3.4
Circumpolar/ Submediterranean-subatlantic	1	3.4
Eurasian	1	3.4
Mediterranean	1	3.4
<b>total</b>	<b>29</b>	<b>100</b>

**Table 6.** Phytogeographical elements of the flora of Mt Golo Bardo (according to Assyov & Petrova 2006).

Chorological type		Number of taxa	% of the total number of taxa
1	2		
subMed	Submediterranean	119	16.4
Eur-Med	Euro-Mediterranean	105	14.5
Eur-As	Eurasian	94	13.0
Eur-Sib	Euro-Siberian	60	8.3
Eur	European	55	7.6
Med	Mediterranean	36	5.0
Pont-Med	Pontic-Mediterranean	36	5.0
Boreal	Boreal	29	4.0
Bal	Balkan	28	3.9
subBoreal	Sub Boreal	28	3.9
Kos	Cosmopolitan	19	2.6
Eur-subMed	Euro-Submediterranean	17	2.3
Pont	Pontic	11	1.5
Bal-Dac	Balkan-Dacian	8	1.1
sPont	South Pontic	8	1.1
Eur-OT	Euro-Oriental Turanian	6	0.8
Ap-Bal	Apeninian-Balkan	5	0.7
Bal-Anat	Balkan-Anatolian	5	0.7
Eur-sMed	Euro-South Mediterranean	4	0.6
Med-As	Mediterranean-Asiatic	4	0.6
Pont-Sib	Pontic-Siberian	4	0.6
Pont-subMed	Pontic-Submediterranean	4	0.6
Bul	Bulgarian	3	0.4
Eur-Pont	Euro-Pontic	3	0.4
Med-CAs	Mediterranean-Central Asiatic	3	0.4
Pann-Bal	Pannonian-Balkan	3	0.4
Pont-Bal	Pontic-Balkan	3	0.4
sSib	South-Siberian	3	0.4
Carp-Bal	Carpathian-Balkan	2	0.3
Eur-Med-CAs	Euro-Mediterranean-Central Asiatic	2	0.3
Med-OT	Mediterranean-Oriental Turanian	2	0.3
sMed-CAs	South Mediterranean-Central Asiatic	2	0.3
subMed-As	Submediterranean-Asiatic	2	0.3
Alp-Carp	Alpo-Carpathian	1	0.1
Alp-Carp-Bal	Alpo-Carpathian-Balkan	1	0.1
Alp-Med	Alpo-Mediterranean	1	0.1
Bal-Dac-Anat	Balkan-Dacian-Anatolian	1	0.1
CAs (Adv)	Central Asiatic-Adventive	1	0.1
CsEur	Central South European	1	0.1
Eur-As/Paleo	Eurasian/ Paleo	1	0.1
Eur-CAs	Euro-Central Asiatic	1	0.1
Pont-CAs	Pontic-Central Asiatic	1	0.1
sMed-As	South Mediterranean-Asiatic	1	0.1
subMed-Sib	Submediterranean-Siberian	1	0.1
<b>total</b>		<b>724</b>	<b>100.0</b>

Central European forests and even of species originating from the northern parts of Europe and Asia. The Mediterranean influence, although rather weakened, favours the settling of southern species. The calcareous baserock also exercises an impact on the advent of thermophilous and xerophytic representatives from the south, offering warm and dry habitats in summer.

According to Assyov & Petrova (2006) the following endemic elements has been found on the mountain: 28 Balkan (3.9 %) and three Bulgarian (0.4 %). This fact testifies to originality and naturalness. Emergence and preservation of the endemic elements on Mt Golo Bardo is directly linked to the calcareous terrains creating specific habitats.

A phytogeographical analysis of the flora of the Ostritsa MR was made by Pavlov & Dimitrov (2002). The results were very close and there was one full coincidence with the leading floristic elements. Mention deserves the stronger expressed Balkan and Bulgarian floristic elements on the territory of the Reserve, represented respectively by 7.3 % and 1.1 %. The high degree of endemism concentrated in the protected territory has proved the naturalness and typicality of its flora.

Distribution of the floristic elements according to the classification of Gajić (1980, 1984) (Table 7) has shown the strongest presence of the Pontic-Central Asiatic elements with 25.8 %, Submediterranean 24.0 %, Eurasian 20.9 %, and Central European 17.3 %. The Pontic-Central Asiatic elements were steppe elements originating from Europe, the Submediterranean comprised species from the European part of the Mediterranean, the Eurasian comprised species originating generally from Europe and Asia, and the Central European originated from the central parts of Europe. At subelements level, the lead was taken by the Sub Central European with 12.8 % participation, Eurasian with 11.5 % and Submediterranean with 10.8 % This distribution confirmed the advent of plants characteristic both of the temperate and northern regions, as well as of southern species determined by the phytogeographical spectrum according to Assyov & Petrova (2006).

According to Gajić (1984) thirteen species referred to the group of endemic elements occur on Mt Golo Bardo, which accounts for 1.8 %. Mention deserves the great difference with the Balkan (3.9 %) and Bulgarian (0.4 %) floristic elements observed there according to the data Assyov & Petrova. It could be explained with the scope of the floristic elements of the two classifications. Assyov & Petrova (2006) regarded the Balkan flo-

Table 7. Phytogeographical elements of the flora of Mt Golo Bardo (according to Gajić 1980, 1984).

Chorological type			Number of taxa	of the total number of taxa
1	2	3		
<b>element</b>	<b>Pont-Ca</b>	<b>Pontic-Central Asiatic</b>	<b>187</b>	<b>25.8</b>
subelement	Pont-Subm	Pontic-Submediterranean	32	4.4
subelement	Subpont	Sub Pontic	25	3.5
subelement	Pont-Ca	Pontic-Central Asiatic	20	2.8
subelement	Subpont-Subm	Sub Pontic-Submediterranean	20	2.8
subelement	Pont-Pan	Pontic-Pannonian	19	2.6
subelement	Pont	Pontic	16	2.2
subelement	Subpont-Ca	Sub Pontic-Central Asiatic	16	2.2
subelement	Pont-Ca-Subm	Pontic-Central Asiatic-Submediterranean	13	1.8
subelement	Pont-is-Subm	Pontic-East Submediterranean	8	1.1
subelement	Subpan	Sub Pannonian	6	0.8
subelement	Subpont-Subca-Subm	Sub Pontic-Sub Central Asiatic-Submediterranean	4	0.6
subelement	Subpont-Ca-Subm	Sub Pontic-Central Asiatic-Submediterranean	3	0.4
subelement	Subtaur	Sub Tauric	3	0.4
subelement	Subpont-Subpan	Sub Pontic-Sub Pannonian	2	0.3
<b>element</b>	<b>Subm</b>	<b>Submediterranean</b>	<b>174</b>	<b>24.0</b>
subelement	Subm	Submediterranean	78	10.8
subelement	is.Subm	East Submediterranean	26	3.6
subelement	Submez	Sub Moesian	16	2.2
subelement	Subeuks	<i>Sub Euxinian</i>	8	1.1
subelement	Balk	Balkan	6	0.8
subelement	Mez	Moesian	6	0.8
subelement	Subsrbalk	Sub Central Balkan	6	0.8
subelement	Srbalk	Central Balkan	4	0.6
subelement	Subsk-Pind	Sub Scardus-Pindus	3	0.4
subelement	Mez-Dac	Moesian-Dacian	2	0.3
subelement	Srbalk-Apen	Central Balkan-Apenninian	2	0.3
subelement	Srbalk-j-Apen	Central Balkan-South Apenninian	2	0.3
subelement	Subbalk	Sub Balkan	2	0.3
subelement	Submez-Subpan	Sub Moesian-Sub Pannonian	2	0.3
subelement	Balk-Apen	Balkan-Apenninian	1	0.1
subelement	Balk-c.j.Apen	Balkan-Central South Apenninian	1	0.1
subelement	Balk-j.Apen	Balkan-South Apenninian	1	0.1
subelement	Ilir	Illyrian	1	0.1

Table 7. Continuation

1	2	3	4	5
subelement	Mez-Karp	Moesian-Carpathian	1	0.1
subelement	Mez-Sk-Pind	Moesian-Scardus-Pindus	1	0.1
subelement	Mez-Subdac	Moesian-Sub Dacian	1	0.1
subelement	Srbalk-c.j.Apen	Central Balkan-Central South Apenninian	1	0.1
subelement	Subdac	Sub Dacian	1	0.1
subelement	Subilir	Sub Illyrian	1	0.1
subelement	Submez-Subdac	Sub Moesian-Sub Dacian	1	0.1
<b>element</b>	<b>Evr</b>	<b>Eurasian</b>	<b>151</b>	<b>20.9</b>
subelement	Evr	Eurasian	83	11.5
subelement	Subevr	Sub Eurasian	49	6.8
subelement	Subj.sib	Sub South Siberian	17	2.3
subelement	Evroafr	Euro Africanian	2	0.3
<b>element</b>	<b>Se</b>	<b>Central European</b>	<b>125</b>	<b>17.3</b>
subelement	Subse	Sub Central European	93	12.8
subelement	Se	Central European	32	4.4
<b>element</b>	<b>Kosm</b>	<b>Cosmopolitan</b>	<b>40</b>	<b>5.5</b>
subelement	Cirk	Circumpolaric	20	2.8
subelement	Kosm	Cosmopolitan	13	1.8
subelement	Subcirk	Sub Circumpolaric	7	1.0
<b>element</b>	<b>Subatl</b>	<b>Sub Atlantic</b>	<b>26</b>	<b>3.6</b>
subelement	Subatl-Subm	Sub Atlantic-Submediterranean	26	3.6
<b>element</b>	<b>Endem</b>	<b>Endemic</b>	<b>13</b>	<b>1.8</b>
subelement	End-6	Central Moesian Endemics	5	0.7
subelement	End-15	West Moesian-North Scardus-Pindus Endemic	3	0.4
subelement	End-1	West Moesian Endemic	1	0.1
subelement	End-13	West Moesian-South Illyrian Endemic	1	0.1
subelement	End-16	Central and South Moesian-North Scardus-Pindus Endemic	1	0.1
subelement	End-26	Southeast and East Illyrian-North Scardus-Pindus Endemic	1	0.1
subelement	Subend	Subendemic	1	0.1
<b>element</b>	<b>Boreal</b>	<b>Boreal</b>	<b>3</b>	<b>0.4</b>
subelement	Subbor-Cirk	Sub Boreal-Circumpolaric	2	0.3
subelement	Subbor-Evr	Sub Boreal-Eurasian	1	0.1
<b>element</b>	<b>Pustinni</b>	<b>Desert</b>	<b>3</b>	<b>0.4</b>
subelement	Iran-Euks	Irano- <i>Euxinian</i>	2	0.3
subelement	Subiran-is-Subm	Sub Irano-East Submediterranean	1	0.1
<b>element</b>	<b>Adv</b>	<b>Adventive</b>	<b>2</b>	<b>0.3</b>
subelement	Adv	Adventive	2	0.3
<b>element</b>		<b>total</b>	<b>724</b>	<b>100.0</b>



ristic elements in a more general sense, including plants originating and inhabiting the Balkan Peninsula in general. In Gajić's classification the plant species from the Balkan Peninsula were referred to various floristic sub-elements, such as Balkan, Mysian, endemic, etc. Thus, we could refer the Balkan and Mysian elements according to Gajić, found on the mountain and represented by 0.8% each, to the endemics in a more general sense.

According to Stefanov (1943), in terms of origin and ecologo-geographical relations, the floristic elements were divided into thermophytes from the Mediterranean Centre, thermophytes from the South Continental Centre, thermophytes from the North Continental Centre, mesotherms and microtherms from the Silvoboreal Centre, and thermophytes, mesotherms and microtherms from the Mountain Centre. In terms of structural and physiognomic specificities and intensity of the vegetative activity of plants, the author differentiated them into stationary elements, mobile plants with secondarily extended areas in Bulgaria, and elements penetrating into Bulgaria by secondary colonization. According to Stefanov, most important for the primary floristic composition was the influence of the stationary elements, while its enrichment with allochthonous elements was mainly due to elements penetrating into Bulgaria by secondary colonization. His studies of the phytogeographical elements in Bulgaria showed that the Bulgarian flora has

been composed mainly by stationary mountain and silvoboreal elements, while the secondary were mainly due to the mobile continental vegetation. The plant species on Mt Golo Bardo were distributed according to the phytogeographical elements set by Stefanov (1943) (Table 8). The chorological spectrum has shown that 36.2% of the flora of the mountain was built of elements of the Mountain Centre, followed by elements of the Northern (21.7%) and Southern Continental Centres (19.2%), by the Silvoboreal Centre (17.4%), and the poorest represented Mediterranean Centre (5.2%). The strongest participation of elements of the Mountain Centre in the flora of Mt Golo Bardo corresponded to the chorological spectrum for the whole of Bulgaria (Stefanov 1943). Mention deserves, however, the strong participation of the elements of the Northern and Southern Continental Centres, which have managed to displace the elements of the Silvoboreal Centre occupying the second place in the flora of Bulgaria, after the elements of the Mountain Centre. This fact could be explained by the strongly expressed mobility characteristic of the continental species, notable in the distribution of the stationary, mobile and secondarily penetrated elements found on the mountain (Table 8). The species of the Mountain Centre recorded in Mt Golo Bardo accounted for the largest share of stationary elements in the mountain (55.0%), those of the Northern Continental Centre participated with the high-

**Table 8.** Floristic elements of the flora of Mt Golo Bardo (according to Stefanov 1943).

Floristic elements	Number of stationary elements (1)	% of the total number of stationary elements	Number of mobile plants with secondarily extended areas in Bulgaria (2)	% of the total number of mobile plants with secondarily extended areas in Bulgaria	Number of elements penetrating into Bulgaria by secondary colonization (3)	% of the total number of elements penetrating into Bulgaria by secondary colonization	Total number	% of the total number of floristic elements in Mt Golo Bardo
Thermophytes from the Mediterranean Centre (MedC)	16	3.8	7	4.3	15	10.6	38	5.2
Thermophytes from the South Continental Centre (SCC)	14	3.3	27	16.6	98	69.5	139	19.2
Thermophytes from the North Continental Centre (NCC)	81	19.3	56	34.4	20	14.2	157	21.7
Mesotherms and microtherms from the Silvoboreal Centre (SC)	78	18.6	46	28.2	2	1.4	126	17.4
Thermophytes, mesotherms and microtherms from the Mountain Centre (MtC)	231	55.0	27	16.6	4	2.8	262	36.2
Plants from other Phytogeographical centres penetrating into Bulgaria by secondary colonization (Adv)	0	0.0	0	0.0	2	1.4	2	0.3
<b>Total</b>	<b>420</b>	<b>58.0</b>	<b>163</b>	<b>22.5</b>	<b>141</b>	<b>19.5</b>	<b>724</b>	<b>100.0</b>

est number of mobile elements (34.4%), and those of the Southern Continental Centre were most important among the elements of secondary penetration in Bulgaria (69.5%). Besides with their great mobility, the strong participation of species of the Northern Continental Centre could be also explained by the existence of suitable conditions for their development. These conditions include the relatively cold and long spring, as well as the fact that calcareous terrains are slower warmed, owing to their ability to longer retain the cold snow waters (Vasilev & Andreev 1992). Penetration of the secondary elements from the Southern Continental Centre and poorer participation of mesotherms and microtherms from the Silvoboreal Centre was mainly due to the Mediterranean influence on the climate and the small amount of precipitations in the summer. The dry and warm conditions favoured the advent of southern species, among which those from the Southern Continental Centre were greater in number than those from the Mediterranean Centre, as the latter were not typically mobile which, in turn, explained their small share in the flora of the mountain.

Vasilev & Andreev (1992) made a chorological analysis according the classification of Stefanov. It could be claimed that the results of their study and those of the present one completely coincide. They have only failed to present the distribution of the stationary, mobile and secondary elements within the different groups of floristic elements, which obscures orientation of the origin of autochthonous and allochthonous complexes in Mt Golo Bardo.

Relict elements were relative poorly represented in the flora of Golo Bardo (3.5% of the species composition) (Gajić 1984), including one Glacial and twenty-four Tertiary relicts.

The conservation status of the plant species in Golo Bardo is presented in Table 9. Pursuant to the Biological Diversity Act (2002, 2007), there are 19 protected species (given in Supplement 3 of the Act), four species fall under Supplement 2 and 2a which gives plant and animal species whose habitats could be protected by means of protected zones and protected area, and 32 species are referred to Supplement 4 comprising species under a protection regime and regulated use of nature. One *Critically Endangered* (Fig. 1), eight *Endangered* (Fig. 2), 10 *Vulnerable*, five *Near Threatened* species according to the *Red List of Bulgarian Vascular Plants* (Petrova & Vladimirov 2009) are distributed in the territory. According to the IUCN list (Walter & Gillet 1998), there are three Rare, one Vulnerable and one Endangered species. Two spe-

cies was registered on Mt Golo Bardo which falls under the *Convention on the protection of European Wildlife and Natural Habitats* (the Bern Convention). Eighteen species from the mountain flora are featured in Supplement 2 to the Convention on international trade with threatened species of the wild fauna and flora (CITES). Three species have been found falling under Directive 92/43/EEC for the protection of natural habitats and of the wild fauna and flora (Supplement 4). The plant species on Mt Golo Bardo with conservation status totaled 66 (9.1% of the species on the mountain), some of which fall into more than one category. The obtained results invite the conclusion that a great many rare, threatened and protected species occur on the mountain that are of scientific and environmental interest. The authors of the earlier studies had come to the same conclusion (Vasilev 1973, 1981; Vasilev & Andreev 1992; Pavlov & Dimitrov 2002). These studies, however, would not be discussed here, owing to the use of different literary sources and the corrections they were subject to throughout the years.

In 1943, the great richness of vegetation in the mountain and the number of valuable species identified on its territory gave grounds for the establishment of a National Park (Vasilev & Andreev 1978) around peak Ostritsa, where these species were most concentrated. Subsequently in 1961, that Park was turned in-



Fig. 1. *Ophrys insectifera* – CR (photo S. Stoyanov).



Fig. 2. *Astragalus wilmottianus* – EN (photo S. Stoyanov).

to a botanic Reserve and still later in 1999 into a Managed Reserve. In 2007, in relation with the European Ecological Network NATURA 2000, a protected zone was set under Directive 92/43/EEC for the conservation of natural habitats and of the wild fauna and flora, under the name Ostritsa. It included most of the territory of the mountain and covered its central and eastern parts. Ostritsa MR falls into the boundaries of the protected zone and constitutes 3.3% of its area. Besides its main task for protection of specific habitats, this environmental measure would strengthen the opportunities for protection of valuable species, which do not fall into the territory of the Reserve (such as *Centaurea immanuelis-loewii* Degen).

Table 9. Conservation status of the species on Mt Golo Bardo.

Taxon	Bulgarian Biological Diversity Act	Red List of Bulgarian vascular plants	IUCN Red List of Threatened Plants	Convention on the Conservation of European Wild-life and Natural Habitats (Bern Convention)	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora
1	2	3	4	5	6	7
<i>Acanthus balcanicus</i> Heyw. & F.B.K. Richardson		LC				
<i>Adonis vernalis</i> L.					Annex 2	
<i>Allium cupani</i> Rafin.		VU				
<i>Anemone sylvestris</i> L.	Annex 3	NT				
<i>Anthyllis aurea</i> Welden	Annex 3	VU				
<i>Asparagus officinalis</i> L.	Annex 4					
<i>Asparagus tenuifolius</i> Lam.	Annex 4					
<i>Asphodeline taurica</i> (Pall. ex M. Bieb.) Kunth.		NT				
<i>Astragalus wilmottianus</i> Stoj.	Annex 3	EN	R			
<i>Bromus moesiacus</i> Velen.	Annex 2a	NT	R	Annex 1		
<i>Bupleurum affine</i> Sadler	Annex 4					
<i>Bupleurum apiculatum</i> Friv.	Annex 4					
<i>Bupleurum commutatum</i> Boiss. & Balansa	Annex 4					
<i>Bupleurum falcatum</i> L.	Annex 4					
<i>Bupleurum praealtum</i> L.	Annex 4					
<i>Bupleurum rotundifolium</i> L.	Annex 4					
<i>Cachrys alpina</i> M. Bieb.	Annex 3					
<i>Centaurea immanuelis-loewii</i> Degen	Annex 2. Annex 3	EN	E			Annex 4
<i>Cephalanthera damasonium</i> (Mill.) Druce					Annex 2	
<i>Coeloglossum viride</i> (L.) Hartm.		VU			Annex 2	
<i>Crocus biflorus</i> Mill.	Annex 4					
<i>Crocus flavus</i> Weston	Annex 4					
<i>Crocus olivieri</i> J. Gay	Annex 3. Annex 4					
<i>Daphne cneorum</i> L.		EN				
<i>Draba lasiocarpa</i> Rochel		LC				
<i>Echinops banaticus</i> Schrad.	Annex 4					
<i>Echinops sphaerocephalus</i> L.	Annex 4					

Table 9. Continuation

1	2	3	4	5	6	7
<i>Echium russicum</i> J.F. Gmel	Annex 2. Annex 3	VU				Annex 4
<i>Edraianthus serbicus</i> Petrović	Annex 3	EN				
<i>Epipactis purpurata</i> Sm.	Annex 3	EN			Annex 2	
<i>Eryngium palmatum</i> Pančić & Vis.	Annex 3	NT				
<i>Erythronium dens-canis</i> L.	Annex 4					
<i>Fritillaria orientalis</i> Adams.	Annex 3	VU				
<i>Galanthus elwesii</i> Hook. f.	Annex 3	EN			Annex 2	
<i>Gladiolus imbricatus</i> L.	Annex 4					
<i>Gymnadenia conopsea</i> (L.) R. Br.					Annex 2	
<i>Gypsophila glomerata</i> Pall. ex M. Bieb.	Annex 4					
<i>Himantoglossum caprinum</i> (M. Bieb.) Spreng.	Annex 2 Annex 3	VU		Annex 1	Annex 2	Annex 4
<i>Laserpitium siler</i> L.		LC				
<i>Lilium martagon</i> L.	Annex 4					
<i>Limodorum abortivum</i> (L.) Sw.	Annex 3	VU			Annex 2	
<i>Neottia nidus-avis</i> (L.) Rich.					Annex 2	
<i>Ononis adenotricha</i> Boiss.		NT	R			
<i>Ophrys apifera</i> Huds.	Annex 3	EN			Annex 2	
<i>Ophrys cornuta</i> Steven	Annex 3	VU			Annex 2	
<i>Ophrys insectifera</i> L.	Annex 3	CR				
<i>Orchis morio</i> L.	Annex 4				Annex 2	
<i>Orchis pallens</i> L.	Annex 4				Annex 2	
<i>Orchis pinetorum</i> Boiss. & Kotschy	Annex 4					
<i>Orchis purpurea</i> Huds.	Annex 4				Annex 2	
<i>Orchis simia</i> Lam.	Annex 4					
<i>Orchis tridentata</i> Scop.	Annex 4				Annex 2	
<i>Orchis ustulata</i> L.	Annex 4	VU			Annex 2	
<i>Platanthera chlorantha</i> (Custer) Rchb.					Annex 2	
<i>Polygonatum odoratum</i> (Mill.) Druce	Annex 4					
<i>Primula veris</i> L.	Annex 4					
<i>Primula vulgaris</i> Huds.	Annex 4					
<i>Pulsatilla montana</i> (Hoppe) Rchb.	Annex 4					
<i>Salix caprea</i> L.	Annex 4					
<i>Scilla bifolia</i> L.	Annex 4					
<i>Sternbergia colchiciflora</i> Waldst. & Kit.					Annex 2	
<i>Stipa capillata</i> L.	Annex 4					
<i>Stipa epilosa</i> Martinovský	Annex 4					
<i>Tragopogon balcanicum</i> Velen.		LC				
<i>Tulipa urumoffii</i> Hayek	Annex 3	VU	V			
<i>Verbascum urumovii</i> Stoj. & Acht.	Annex 3	EN				

**Red List of Bulgarian vascular plants:** CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern. **IUCN Red List of Threatened Plants:** E – Endangered; V – Vulnerable; R – Rare.

## Conclusion

The systematic analysis of the mountain's flora confirms the great species diversity amounting approximately to 1/5 of the plant species in Bulgaria. For the needs of a more exact and full taxonomic structure of the flora, a systematic list would be needed. With its help during subsequent studies there could be discussed the con-

crete taxa used to determine the indexes for the floristic analysis. Irrespective of the long-term interest in the mountain's flora, the mosses have so far remained outside the investigations. This study adds 29 moss species to the systematic list of the mountain's flora.

One of the main reasons for the floristic diversity of Mt Golo Bardo, constituting both of some typical for Bulgaria Central European and of steppe and south-

ern species, is the Mediterranean influence on the temperate continental climate of the mountain. This fact is confirmed by the biological and chorological analyses of the flora. In the present study three qualification systems have been used for phytogeographical analysis: Central European by Assyov & Petrova (2006), Serbian by Gajić (1984) and Bulgarian by Stefanov (1943). Although the principles on which they were developed did not coincide completely, the results are similar and comparable. The advantage of Stefanov's classification is that, besides in geographical terms concerning the origin of taxa, he provided information about their mobility, which helps draw the conclusions about the autochthonous and allochthonous elements in the flora.

Data on the relict, endemic, rare, threatened and protected plants help us assess how valuable or vulnerable a

particular flora is. This information needs to be updated, in order to reflect the corrections and additions to the various normative documents. The registration of species with conservation status occurring on Mt Golo Bardo follows the data given in the *Red List of Bulgarian Vascular Plants* (Petrova & Vladimirov 2009).

In conclusion, the results of the present study show that the interest in the flora of Mt Golo Bardo has not abated through the years and that data on its status are permanently updated and enriched.

**Acknowledgements.** The authors are grateful to Dr Anna Ganeva (Bulgarian Academy of Sciences) for her help for identification of moss flora of Golo Bardo and for the specializing course of Systematics of Bryophytes. Special thanks are extended to the anonymous reviewer for critical notes.

### Supplement 1. Floristic list.

Taxon	floristic elements according to Boros (1968)
<b>Bryophyta</b>	
<b>Marchantiopsida (Hepatopsida)</b>	
<b>Geocalycaceae</b>	
<i>Lophocolea minor</i> Nees	circumpolar
<b>Bryopsida</b>	
<b>Amblystegiaceae</b>	
<i>Amblystegium serpens</i> (Hedw.) Schimp.	circumpolar, nearly cosmopolitan
<i>Campylium chrysophyllum</i> (Brid.) Lange	circumpolar
<b>Brachytheciaceae</b>	
<i>Brachythecium salebrosum</i> (F. Weber & D. Mohr) Schimp.	circumpolar
<i>B. velutinum</i> (Hedw.) Schimp.	nearly cosmopolitan
<i>Eurhynchium hians</i> (Hedw.) Sande Lac.	circumpolar
<i>Homalothecium lutescens</i> (Hedw.) H. Rob.	circumpolar/ kontinental
<i>Scleropodium purum</i> (Hedw.) Limpr.	eurasian
<b>Bryaceae</b>	
<i>Bryum capillare</i> Hedw.	circumpolar, nearly cosmopolitan
<i>B. pallescens</i> Schleich. ex Schwdgr.	circumpolar
<i>B. subelegans</i> Kindb.	circumpolar, nearly cosmopolitan
<b>Dicranaceae</b>	
<i>Dicranum scoparium</i> Hedw.	circumpolar, nearly cosmopolitan
<b>Ditrichaceae</b>	
<i>Ceratodon purpureus</i> (Hedw.) Brid.	cosmopolitan
<i>Distichium capillaceum</i> (Hedw.) Bruch & Schimp.	nearly cosmopolitan

Taxon	floristic elements according to Boros (1968)
<i>Ditrichum flexicaule</i> (Schwdgr.) Hampe	circumpolar
<b>Encalyptaceae</b>	
<i>Encalypta streptocarpa</i> Hedw.	circumpolar
<b>Fissidentaceae</b>	
<i>Fissidens dubius</i> P. Beauv.	circumpolar/ submediterranean-subatlantic
<b>Grimmiaceae</b>	
<i>Grimmia pulvinata</i> (Hedw.) Sm.	circumpolar, nearly cosmopolitan
<b>Hypnaceae</b>	
<i>Hypnum cupressiforme</i> Hedw.	cosmopolitan
<b>Mniaceae</b>	
<i>Plagiomnium affine</i> (Blandow ex Funck) T. J. Kop.	circumpolar
<i>P. undulatum</i> (Hedw.) T. J. Kop.	circumpolar with mediterranean-atlantic char.
<b>Polytrichaceae</b>	
<i>Atrichum undulatum</i> (Hedw.) P. Beauv.	circumpolar
<i>Polytrichum formosum</i> Hedw.	circumpolar
<b>Pottiaceae</b>	
<i>Tortula subulata</i> Hedw.	circumpolar with mediterranean char.
<b>Thuidiaceae</b>	
<i>Thuidium abietinum</i> (Hedw.) Schimp.	circumpolar with kontinental char.
<i>T. philibertii</i> Limpr.	circumpolar
<i>T. recognitum</i> (Hedw.) Lindb.	circumpolar
<b>Trichostomaceae</b>	
<i>Tortella flavovirens</i> (Bruch) Broth.	mediterranean
<i>T. tortuosa</i> (Hedw.) Limpr.	circumpolar

## Supplement 1. Floristic list – continuation.

Taxon	floristic elements* according to			Life forms according to Raunkiaer (1934)
	Assyov & Petrova (2006)	Gajić (1980, 1984)	Stefanov (1943)	
1	2	3	4	5
<b>Equisetophyta</b>				
<b>Equisetaceae</b>				
<i>Equisetum arvense</i> L.	Boreal	Cirk	NCC 3	H
<b>Polypodiophyta</b>				
<b>Aspleniaceae</b>				
<i>Asplenium ruta-muraria</i> L.	Boreal	Cirk	SC 1	H
<i>A. trichomanes</i> L.	Kos	Kosm	SC 1	H
<b>Athyriaceae</b>				
<i>Cystopteris fragilis</i> (L.) Bernh.	Kos	Kosm	SC 1	H
<b>Hipolepidaceae</b>				
<i>Pteridium aquilinum</i> (L.) Kuhn	Kos	Kosm	MedC 3	H
<b>Pinophyta</b>				
<b>Cupressaceae</b>				
<i>Juniperus communis</i> L.	subBoreal	Cirk	SC 1	Ph
<i>J. oxycedrus</i> L.	Med	Subm	MedC 1	Ph
<b>Pinaceae</b>				
<i>Pinus nigra</i> Arnold	subMed	Subm	MtC 1	Ph
<i>P. sylvestris</i> L.	subBoreal	Subbor-Evr	SC 1	Ph
<b>Magnoliophyta</b>				
<b>Magnoliopsida</b>				
<b>Acanthaceae</b>				
<i>Acanthus balcanicus</i> Heyw. & F.B.K. Richardson	Bal	Balk	MtC 1	H
<b>Aceraceae</b>				
<i>Acer campestre</i> L.	Eur-OT	Subse	MtC 1	Ph
<i>A. hyrcanum</i> Fisch. & C. A. Mey.	subMed	Submez	MtC 1	Ph
<i>A. pseudoplatanus</i> L.	Eur-Med	Se	MtC 1	Ph
<i>A. tataricum</i> L.	subMed	Pont-Pan	NCC 1	Ph
<b>Anacardiaceae</b>				
<i>Cotinus coggygria</i> Scop.	Med-As	Pont-Ca-Subm	MtC 1	Ph
<b>Apiaceae</b>				
<i>Aegopodium podagraria</i> L.	Eur-Sib	Evr	SC 1	H
<i>Anthriscus sylvestris</i> (L.) Hoffm.	Eur	Subse	SC 2	H
<i>Bupleurum affine</i> Sadler	subMed	Pont-Pan	NCC 2	Th
<i>B. apiculatum</i> Friv.	Bal	Mez	MedC 2	Th
<i>B. commutatum</i> Boiss. & Balansa	Pont-Med	Submez	SCC 1	Th
<i>B. falcatum</i> L.	subMed	Evr	MtC 1	H
<i>B. praealtum</i> L.	subMed	Subm	MtC 1	Th
<i>B. rotundifolium</i> L.	Eur-As	Subpont-Subm	SCC 3	Th
<i>Cachrys alpina</i> M. Bieb.	Pont	Subtaur	MtC 1	H
<i>Caucalis platycarpus</i> L.	Eur-CAs	Subpont	SCC 3	Th
<i>Chaerophyllum temulum</i> L.	Eur-Med	Subse	SC 2	Th
<i>Daucus carota</i> L.	Eur-As	Subevr	SCC 3	Th
<i>Eryngium campestre</i> L.	Pont-Med	Subpont-Subm	NCC 2	H
<i>E. palmatum</i> Pančić & Vis.	Bal	End-15	MtC 1	H
<i>Falcaria vulgaris</i> Bernh.	Eur-As	Pont-Ca	NCC 1	H
<i>Ferulago campestris</i> (Besser) Grecescu	Eur-Sib	Pont	SCC 1	H

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>F. sylvatica</i> (Besser) Rchb.	subMed	Pont-is.Subm	NCC 1	H
<i>Heracleum ternatum</i> Velen.	Med	Mez	SC 1	H
<i>Laser trilobum</i> (L.) Borkh.	Eur-Med	Subeuks	MtC 1	H
<i>Laserpitium siler</i> L.	subMed	Subm	MtC 1	H
<i>Orlaya grandiflora</i> (L.) Hoffm.	Ap-Bal	Subm	MedC 3	Th
<i>Peucedanum alsaticum</i> L.	subMed	Subpont-Ca	NCC 2	H
<i>P. arenarium</i> Waldst. & Kit.	Eur-Med	Pont-Pan	NCC 1	H
<i>P. austriacum</i> (Jacq.) Koch	Pont	is.Subm	MtC 1	H
<i>P. cervaria</i> (L.) Lapeyr.	subMed	Pont-Ca-Subm	NCC 1	H
<i>Physospermum cornubiense</i> (L.) DC.	Eur-Med	Subm	MtC 1	H
<i>Pimpinella saxifraga</i> L.	Eur-As	Subj.sib	NCC 1	H
<i>P. tragium</i> Vill.	Pont-subMed	Subm	MtC 1	H
<i>Sanicula europaea</i> L.	Eur-Sib	Evroafr	SC 1	H
<i>Scandix pecten-veneris</i> L.	Eur-As	Subatl-Subm	SCC 3	Th
<i>Seseli annuum</i> L.	Eur-As	Pont-Ca	SC 2	H
<i>S. libanotis</i> (L.) Koch.	Eur-Sib	Evr	NCC 1	H
<i>Torilis arvensis</i> (Huds.) Link	Eur-As	Evroafr	SCC 3	Th
<i>T. japonica</i> (Houtt.) DC.	Eur-As	Subse	SCC 2	Th
<i>Trinia glauca</i> (L.) Dumort.	subMed	Subm	MtC 1	H
<b>Apocynaceae</b>				
<i>Vinca herbacea</i> Waldst. & Kit.	Eur-Med	Pont-Pan	MtC 1	H
<b>Araliaceae</b>				
<i>Hedera helix</i> L.	Eur-As	Subatl-Subm	MtC 1	Ph
<b>Aristolochiaceae</b>				
<i>Aristolochia clematis</i> L.	Eur-Med	Subm	NCC 3	H
<i>Asarum europaeum</i> L.	Eur-Sib	Evr	SC 1	H
<b>Asclepiadaceae</b>				
<i>Vincetoxicum hirundinaria</i> Medic.	Eur-Sib	Pont-Ca	NCC 2	H
<b>Asteraceae</b>				
<i>Achillea ageratifolia</i> (Sm.) Benth. & Hook. f.	Bal	Submez	MtC 1	H
<i>A. clypeolata</i> Sm.	Bal	Mez	MtC 1	H
<i>A. collina</i> (Wirtg.) Heimerl	Eur-subMed	Evr	NCC 2	H
<i>A. setacea</i> Waldst. & Kit.	subMed	Subpont-Ca	NCC 2	H
<i>Anthemis austriaca</i> Jacq.	Eur-Med	Pont-Pan	MtC 3	Th
<i>A. tinctoria</i> L.	Eur-Sib	Subpont-Subca-Subm	SCC 3	H
<i>Arctium lappa</i> L.	Eur-Med	Evr	SCC 3	Th
<i>Artemisia alba</i> Turra	subMed	Subm	MedC 1	H
<i>A. vulgaris</i> L.	subBoreal	Cirk	NCC 3	H
<i>Aster amellus</i> L.	Eur-Med	Pont-Ca	NCC 1	H
<i>A. linosyris</i> (L.) Bernh.	Eur-Med	Subpont-Subm	NCC 1	H
<i>A. oleifolius</i> (Lam.) Wagenitz	Pont-Sib	Pont-Ca	NCC 1	H
<i>Bellis perennis</i> L.	Eur-As	Subse	MtC 2	H
<i>Carduus candicans</i> Waldst. & Kit.	Bal-Dac	Pont	MtC 1	H
<i>Carlina acanthifolia</i> All.	Eur	Se	MtC 1	H
<i>C. vulgaris</i> L.	Eur-Med	Evr	NCC 2	H
<i>Carthamus lanatus</i> L.	subMed	Pont-Subm	SCC 3	Th
<i>Centaurea affinis</i> Friv.	Bal-Dac	is.Subm	MtC 1	H
<i>C. apiculata</i> Ledeb.	Eur-Sib	Subpan	SC 2	H
<i>C. chrysolepis</i> Vis.	Bal	Submez	MtC 1	H
<i>C. immanuelis-loewii</i> Degen	Bal	is.Subm	MedC 1	H
<i>C. orientalis</i> L.	Pont-Med	Pont	NCC 1	H
<i>C. pannonica</i> (Heuff.) Simonk.	Pont-Sib	Subevr	SC 2	H

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>C. rutifolia</i> Sm.	Pont	Submez	MedC 2	H
<i>C. salonitana</i> Vis.	Pont-Med	is.Subm	NCC 1	H
<i>C. solstitialis</i> L.	Eur-Med	Pont-Ca-Subm	SCC 3	Th
<i>C. stenolepis</i> A. Kern.	subMed	Subm	SC 2	H
<i>C. stoebe</i> L.	subMed	Se	NCC 2	H
<i>C. triumfettii</i> All.	subMed	Subse	MtC 1	H
<i>Chamomilla recutita</i> (L.) Rauschert	Eur-As	Evr	SCC 3	Th
<i>Chondrilla juncea</i> L.	Eur-Sib	Pont-Ca-Subm	SCC 3	Th
<i>Cichorium intybus</i> L.	Eur-Sib	Subevr	SCC 3	H
<i>Cirsium arvense</i> (L.) Scop.	Eur-As	Subevr	SCC 3	H
<i>C. canum</i> (L.) All.	Eur-Med	Subpont	NCC 1	H
<i>C. vulgare</i> (Savi) Ten.	Eur-Med	Subevr	NCC 3	H
<i>Crepis sancta</i> (L.) Bornm.	subMed	Pont	SCC 2	Th
<i>C. setosa</i> Haller f.	Eur-Med	Subm	MedC 3	Th
<i>Crupina vulgaris</i> Cass.	subMed	Pont-Ca-Subm	MtC 1	Th
<i>Echinops banaticus</i> Schrad.	subMed	is.Subm	MtC 1	H
<i>E. sphaerocephalus</i> L.	Eur-Med	Evr	NCC 2	H
<i>Erigeron acris</i> L.	Boreal	Cirk	SC 1	H
<i>Hieracium cymosum</i> L.	Eur-Sib	Subpont-Ca	NCC 1	H
<i>H. echioides</i> Lumn.	subMed	Evr	MtC 1	H
<i>H. hoppeanum</i> Schult.	Eur-Med	Se	MtC 2	H
<i>H. pannosum</i> Boiss.	Bal	Balk	MtC 1	H
<i>H. pilosella</i> L.	Eur-Med	Subse	MtC 1	H
<i>H. praealtum</i> Gochnat	Eur-Sib	Subse	NCC 2	H
<i>Hypochaeris maculata</i> L.	Eur-Sib	Evr	NCC 2	H
<i>Inula bifrons</i> L.	Eur-Med	is.Subm	MtC 2	H
<i>I. britannica</i> L.	Eur-Med	Subse	SCC 2	H
<i>I. conyzae</i> (Griess.) DC.	Eur-Med	Subatl-Subm	MtC 1	H
<i>I. ensifolia</i> L.	Eur-Med	Subpont	NCC 1	H
<i>I. hirta</i> L.	Eur-Sib	Subpont-Subca-Subm	NCC 1	H
<i>I. oculus-christi</i> L.	Eur-Med	Pont-Pan	SCC 1	H
<i>Jurinea consanguinea</i> DC.	subMed-Sib	Pont-Ca	NCC 1	H
<i>Lactuca perennis</i> L.	Eur	Subm	MtC 1	H
<i>L. serriola</i> L.	Eur-As	Subpont-Subca-Subm	SCC 3	Th
<i>L. viminea</i> (L.) J. Presl & C. Presl	Eur-Med	Pont-Subm	SCC 3	Th
<i>Lapsana communis</i> L.	Eur-Sib	Subse	NCC 3	Th
<i>Leontodon crispus</i> Vill.	Pont-Med	Pont-Subm	SCC 2	H
<i>Leucanthemum vulgare</i> (Vaill.) Lam.	Eur-Sib	Evr	SC 2	H
<i>Logfia arvensis</i> (L.) Holub.	Eur-Med	Subse	SCC 3	Th
<i>Mycelys muralis</i> (L.) Dumort.	Med	Se	MtC 1	H
<i>Prenanthes purpurea</i> L.	Eur-Med	Se	MtC 1	H
<i>Ptilostemon afer</i> (Jacq.) Greuter	Med	Submez	SCC 1	Th
<i>Scorzonera austriaca</i> Willd.	Eur-Sib	Subpont	NCC 1	H
<i>S. hispanica</i> L.	Med	Pont-Ca-Subm	NCC 1	H
<i>S. laciniata</i> L.	Med	Pont-Ca-Subm	NCC 2	H
<i>S. mollis</i> M. Bieb.	Med	Pont-Subm	SCC 1	G
<i>Senecio jacobaea</i> L.	Eur-Med	Subevr	NCC 2	H
<i>S. vernalis</i> Waldst. & Kit.	Eur-Med	Subpont-Ca	SCC 3	Th
<i>S. vulgaris</i> L.	Eur-As	Evr	SCC 3	Th
<i>Serratula radiata</i> (Waldst. & Kit.) M. Bieb.	sPont	Pont-Pan	NCC 1	H
<i>S. tinctoria</i> L.	Eur-Sib	Subevr	NCC 1	H
<i>Solidago virgaurea</i> L.	Boreal	Subbor-Cirk	SC 1	H



## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Tanacetum corymbosum</i> (L.) Sch. Bip.	Eur-Med	Subpont-Subm	MtC 1	H
<i>Taraxacum erythrospermum</i> Besser	Eur	Subse	SC 1	H
<i>T. officinale</i> F.H. Wigg.	Eur-Med	Evr	SC 2	H
<i>Tragopogon balcanicum</i> Velen.	Bal	Submez	MtC 1	H
<i>T. dubius</i> Scop.	Eur-Med	Pont-Subm	NCC 2	Th
<i>T. porrifolius</i> L.	Med	Subm	MedC 1	Th
<i>T. pratensis</i> L.	Eur-Med	Evr	NCC 2	Th
<i>T. pterodes</i> Petrović	Bal	End-1	MtC 1	G
<i>Tussilago farfara</i> L.	Eur-As	Subevr	NCC 3	H
<i>Xeranthemum annuum</i> L.	subMed	Pont-Subm	NCC 2	Th
<i>X. cylindraceum</i> Sm.	subMed	Pont-Subm	SCC 3	Th
<b>Berberidaceae</b>				
<i>Berberis vulgaris</i> L.	Eur-Med	Subse	SCC 3	Ph
<b>Betulaceae</b>				
<i>Betula pendula</i> Roth	Eur-Sib	Subj.sib	SC 1	Ph
<i>Carpinus betulus</i> L.	Eur-subMed	Se	MtC 1	Ph
<i>C. orientalis</i> Mill.	subMed	is.Subm	MtC 1	Ph
<i>Corylus avellana</i> L.	Med-CAs	Subse	SC 1	Ph
<i>C. colurna</i> L.	Pont-CAs	Iran-Euks	MtC 1	Ph
<i>Ostrya carpinifolia</i> Scop.	subMed	Subm	MtC 1	Ph
<b>Boraginaceae</b>				
<i>Anchusa azurea</i> Mill.	subMed	Subm	SCC 3	H
<i>A. barrelieri</i> (All.) Vitman	subMed	Pont-is.Subm	MtC 2	H
<i>Buglossoides arvensis</i> (L.) I. M. Johnst.	Eur-As	Evr	SCC 3	Th
<i>B. purpureoacerulea</i> (L.) I. M. Johnst.	Eur-As	Pont-Subm	MtC 1	H
<i>Cerinthe minor</i> L.	Pont-Med	Subpont	SCC 3	H
<i>Cynoglossum hungaricum</i> Simonk.	subMed	Pont	MedC 3	H
<i>Echium russicum</i> J. F. Gmel	subMed	Pont-Pan	NCC 1	H
<i>E. vulgare</i> L.	Eur-As	Subse	NCC 3	H
<i>Myosotis arvensis</i> (L.) Hill.	Eur-As	Subevr	SCC 3	Th
<i>M. sylvatica</i> Ehrh. ex Hoffm.	Eur-As	Subevr	SC 1	H
<i>Nonea pulla</i> (L.) DC.	subMed	Subpont	NCC 2	H
<i>N. ventricosa</i> (Sm.) Griseb.	subMed	Pont-Subm	SCC 3	Th
<i>Onosma taurica</i> Pall. ex Willd.	subMed	Pont	NCC 1	H
<i>O. visianii</i> Clementi	Pont-Med	Subsbalk	MtC 1	H
<i>Pulmonaria officinalis</i> L.	Eur	Subse	MtC 1	H
<i>Symphytum tuberosum</i> L.	Eur-Med	Pont-Subm	MtC 1	H
<b>Brassicaceae</b>				
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	Eur-As	Subse	SC 1	H
<i>Alyssum alyssoides</i> (L.) L.	Eur-Med	Subse	SCC 2	Th
<i>A. murale</i> Waldst. & Kit.	Eur-Med	Subpont-Subm	MtC 1	H
<i>A. tortuosum</i> Willd.	Pont-Med	Subpont-Ca	NCC 1	H
<i>Arabis auriculata</i> Lam.	Eur-As	Subm	MtC 1	Th
<i>A. hirsuta</i> (L.) Scop.	Boreal	Cirk	MtC 1	H
<i>A. turrita</i> L.	subMed	Subm	MtC 1	H
<i>Berteroa incana</i> (L.) DC.	sPont	Subpont-Ca	NCC 3	H
<i>Calepina irregularis</i> (Asso) Thell.	Med	Subm	SCC 3	Th
<i>Capsela bursa-pastoris</i> (L.) Medik.	Kos	Kosm	SCC 3	Th
<i>Cardamine bulbifera</i> (L.) Crantz	subBoreal	Subse	MtC 1	H
<i>Clypeola jonthlaspi</i> L.	Med	Subm	SCC 1	Th
<i>Draba lasiocarpa</i> Rochel	Eur-Med	Subpan	MtC 1	H
<i>Erophila verna</i> (L.) Chevall.	Eur-Med-CAs	Subcirk	SCC 3	Th

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Erysimum cuspidatum</i> (M. Bieb.) DC.	Eur-OT	Pont	SCC 3	Th
<i>E. diffusum</i> Ehrh.	CsEur	Subpont-Subpan	NCC 2	H
<i>Lepidium campestre</i> (L.) W. T. Aiton	Eur-sMed	Subse	MedC 3	Th
<i>Rorippa thracica</i> (Griseb.) Fritsch	subMed	Srbalk	MtC 1	H
<i>Thlaspi alliaceum</i> L.	subMed	Subm	MedC 3	Th
<i>T. arvense</i> L.	Eur-As	Subevr	SCC 3	Th
<i>T. goesingense</i> Halócsy	Pont	Srbalk	MtC 1	H
<i>T. perfoliatum</i> L.	Eur-Med	Subse	SCC 2	Th
<b>Campanulaceae</b>				
<i>Asyneuma canescens</i> (Waldst. & Kit.) Griseb. & Schenk	Pont-Bal	Pont-Pan	NCC 1	H
<i>A. limonifolium</i> (L.) Janch.	Ap-Bal	Balk-j.Apen	MtC 1	H
<i>Campanula bononiensis</i> L.	Eur	Subj.sib	MtC 1	H
<i>C. grossekii</i> Heuff.	Bal-Dac	Submez	MtC 1	H
<i>C. lingulata</i> Waldst. & Kit.	Ap-Bal	Srbalk-j.Apen	MtC 1	H
<i>C. persicifolia</i> L.	Eur-Sib	Evr	SC 1	H
<i>C. rapunculooides</i> L.	Eur	Subse	MtC 1	H
<i>Campanula trachelium</i> L.	Boreal	Subevr	SC 2	H
<i>Edraianthus serbicus</i> Petrović	Bal	End-6	MtC 1	H
<i>Jasione heldreichii</i> Boiss. & Orph.	Eur-Med	Submez	MedC 2	Th
<b>Cannabaceae</b>				
<i>Humulus lupulus</i> L.	Eur-Sib	Subj.sib	NCC 2	Ch
<b>Caprifoliaceae</b>				
<i>Lonicera xylosteum</i> L.	Eur-Sib	Evr	SC 1	Ph
<i>Sambucus nigra</i> L.	Eur-Med	Subse	MtC 2	Ph
<i>Viburnum lantana</i> L.	Eur-Med	Subm	MtC 1	Ph
<b>Caryophyllaceae</b>				
<i>Arenaria serpyllifolia</i> L.	Eur-As	Evr	SCC 3	Th
<i>Cerastium banaticum</i> (Rochel) Heuff.	subMed	Submez	MtC 1	H
<i>C. pumilum</i> Curtis	Eur-Med	Subse	SCC 3	Th
<i>C. rectum</i> Friv.	Bal-Dac	Subbalk	MtC 1	Th
<i>Dianthus armeria</i> L.	Eur	Se	MtC 2	H
<i>D. giganteus</i> D'Urv.	subMed	Srbalk	MtC 1	H
<i>D. pelviformis</i> Heuff.	Bal	Mez	MtC 1	H
<i>Gypsophila glomerata</i> Pall. ex M. Bieb.	subMed	Pont	NCC 1	H
<i>G. muralis</i> L.	Eur-As	Evr	MedC 3	Th
<i>Herniaria incana</i> Lam.	Eur-Med	Subatl-Subm	SCC 2	H
<i>Holosteum umbellatum</i> L.	Eur-As	Subevr	SCC 3	Th
<i>Lychnis coronaria</i> (L.) Desr.	Med-OT	Se	MtC 1	H
<i>L. flos-cuculis</i> L.	Eur-Sib	Subj.sib	SC 2	H
<i>Minuartia bosniaca</i> (Beck) K. Malø	Bal	Subilir	MtC 1	H
<i>M. caespitosa</i> (Ehrh.) Degen	Eur-Med	Cirk	SC 1	H
<i>M. glomerata</i> (M. Bieb.) Degen	Eur-Med	Pont-Pan	NCC 1	Th
<i>M. setacea</i> (Thuill.) Hayek	Pont	Subpont-Subm	NCC 1	H
<i>Moehringia trinervia</i> (L.) Clairv.	Eur-As	Evr	SC 1	Th
<i>Paronychia kapela</i> (Hacq.) A.Kern.	subMed	Subm	SCC 1	H
<i>Petrorhagia prolifera</i> (L.) P.W. Ball & Heyw.	Pont-Med	Subpont-Subm	MedC 3	Th
<i>Saponaria bellidifolia</i> Sm.	Med	Subm	MtC 1	H
<i>S. glutinosa</i> M. Bieb.	subMed	is.Subm	MtC 1	H
<i>Scleranthus perennis</i> L.	Eur-Med	Subse	NCC 2	H
<i>Silene alba</i> (Mill.) E.H.L. Krause	Eur-Sib	Subevr	NCC 3	H
<i>S. conica</i> L.	subMed-As	Subpont-Ca-Subm	MedC 2	Th
<i>S. italica</i> (L.) Pers.	Eur-Med	Subm	MtC 1	H

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>S. otites</i> (L.) Weibel	Eur-Med	Evr	NCC 2	H
<i>S. vulgaris</i> (Moench) Garcke	Eur-As	Subevr	MtC 1	H
<i>Stellaria graminea</i> L.	Eur-As	Evr	SC 2	H
<i>S. holostea</i> L.	Eur-Sib	Subevr	MtC 1	H
<i>S. media</i> (L.) Vill.	Kos	Kosm	SCC 3	Th
<i>Viscaria vulgaris</i> Rühl.	Eur-Sib	Subse	NCC 1	H
<b>Celastraceae</b>				
<i>Euonymus europaeus</i> L.	Eur-As	Subse	SC 2	Ph
<i>E. verrucosus</i> Scop.	Eur-Med	Subpont	MtC 1	Ph
<b>Chenopodiaceae</b>				
<i>Chenopodium album</i> L.	Kos	Kosm	SCC 3	Th
<b>Cistaceae</b>				
<i>Fumana procumbens</i> (Dunal) Gren. & Godr.	Pont-Med	Pont-Subm	MtC 1	H
<i>Helianthemum nummularium</i> (L.) Mill.	Alp-Med	Subse	MtC 1	H
<i>Rhodax canus</i> (L.) Fuss.	Pont	Pont-Subm	MtC 1	H
<b>Convolvulaceae</b>				
<i>Calystegia sepium</i> (L.) R. Br.	Kos	Evr	NCC 3	H
<i>Convolvulus arvensis</i> L.	Kos	Kosm	SCC 3	H
<i>C. cantabrica</i> L.	Pont	Pont-Subm	MedC 1	H
<b>Cornaceae</b>				
<i>Cornus mas</i> L.	subMed	Pont-Subm	MtC 1	Ph
<i>C. sanguinea</i> L.	subMed	Subse	MtC 1	Ph
<b>Crassulaceae</b>				
<i>Sedum acre</i> L.	Eur-Med	Subevr	SC 1	H
<i>S. hispanicum</i> L.	Eur-Med	is.Subm	SCC 2	Th
<i>S. maximum</i> (L.) Suter	subBoreal	Evr	SC 1	H
<i>S. ochroleucum</i> Chaix	subMed	is.Subm	MtC 1	H
<i>S. urvillei</i> DC.	Eur	Submez-Subpan	MtC 1	H
<b>Dipsacaceae</b>				
<i>Cephalaria flava</i> (Sibth. & Sm.) Szabo	Bal	End-13	MtC 1	H
<i>C. laevigata</i> (Waldst. & Kit.) Schrad.	subMed	Submez	NCC 1	H
<i>C. uralensis</i> (Murray) Roem. & Schult.	Pont-Med	Pont	NCC 1	H
<i>Dipsacus laciniatus</i> L.	Eur-Med	Pont-Ca-Subm	SCC 3	H
<i>Knautia arvensis</i> (L.) Coult.	Eur-Sib	Subse	SC 2	H
<i>K. drymeia</i> Heuff.	Alp-Carp-Bal	Se	MtC 1	H
<i>K. macedonica</i> Griseb.	Bal	Submez	MtC 3	H
<i>Scabiosa argentea</i> L.	Bal-Anat	Pont-is.Subm	SCC 2	H
<i>S. ochroleuca</i> L.	Eur-Sib	Pont-Ca	NCC 2	H
<i>S. rotata</i> M. Bieb.	Med	is.Subm	SCC 1	Th
<i>S. triniifolia</i> Friv.	Bal	End-16	MtC 2	Th
<i>Succisa pratensis</i> Moench	Eur	Subse	SC 1	H
<b>Euphorbiaceae</b>				
<i>Euphorbia agraria</i> M. Bieb.	subMed	Pont	NCC 1	H
<i>E. amygdaloides</i> L.	Eur	Subatl-Subm	MtC 1	H
<i>E. barrelieri</i> Savi	Med	is.Subm	MtC 1	H
<i>E. cyparissias</i> L.	Eur	Evr	NCC 3	H
<i>E. esula</i> L.	Eur-As	Evr	NCC 2	H
<i>E. falcata</i> L.	Med-As	Subpont-Subm	SCC 2	Th
<i>E. helioscopia</i> L.	Eur-As	Subevr	SCC 3	Th
<i>E. niciana</i> Borb6s	Med	Mez	NCC 2	H
<i>E. polychroma</i> A. Kern.	Eur	Pont-Pan	MtC 1	H
<i>E. taurinensis</i> All.	subMed	Subm	MedC 2	Th

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Mercurialis ovata</i> Sternb. & Hoppe	subMed	Subpont-Subm	MtC 1	H
<i>M. perennis</i> L.	subMed	Subse	MtC 1	H
<b>Fabaceae</b>				
<i>Anthyllis aurea</i> Welden	Bal	End-26	MtC 1	H
<i>A. vulneraria</i> L.	Eur-Med	Subse	MtC 1	Th
<i>A. angustifolius</i> Lam.	subMed	Balk	MtC 1	Ph
<i>A. austriacus</i> Jacq.	subMed	Pont-Ca	NCC 1	H
<i>A. cicer</i> L.	Eur-Sib	Subpont-Ca	NCC 1	H
<i>A. glycyphyllos</i> L.	sPont	Subpont-Ca	SC 1	H
<i>Astragalus onobrychis</i> L.	Eur-As	Subpont-Ca	NCC 2	H
<i>A. spruneri</i> Boiss.	Bal	Submez	MedC 1	H
<i>A. vesicarius</i> L.	Eur-Med	Iilir	NCC 1	H
<i>A. wilmottianus</i> Stoj.	Bal	End-6	NCC 1	H
<i>Chamaecytisus calcareus</i> (Velen.) Kuzmanov	Bal	Balk	MtC 1	Ch
<i>C. ciliatus</i> (Wahlenb.) Rothm.	Pont-Med	Subpan	MtC 1	Ph
<i>C. hirsutus</i> (L.) Link	Eur-Sib	is.Subm	MtC 1	Ph
<i>C. rochelii</i> (Wierzb.) Rothm.	Pont-Med	Pont	MtC 1	Ph
<i>Chamaespartium sagittale</i> (L.) P. Gibbs	Eur	Subatl-Subm	MtC 1	Ch
<i>Coronilla emerus</i> L.	subMed	Subm	MedC 1	Ph
<i>C. scorpioides</i> (L.) W.D.J. Koch	subMed	Subm	SCC 3	Th
<i>C. varia</i> L.	Eur-Med	Subpont	MtC 2	H
<i>Corothamnus agnipilus</i> (Velen.) Klask.	Bal	Balk	MtC 1	Ch
<i>C. procumbens</i> (Waldst. & Kit.) C. Presl	Eur-Med	Subsrbalk	MtC 1	Ch
<i>C. rectipilosus</i> (Adamovic) Skalicka	Bal	Subsrbalk	MtC 1	Ch
<i>Dorycnium herbaceum</i> Vill.	Eur-Med	is.Subm	MtC 2	H
<i>Genista januensis</i> Viv.	subMed	Srbalk-Apen	MtC 1	Ch
<i>G. sessilifolia</i> DC.	subMed	is.Subm	MtC 1	Ch
<i>G. subcapitata</i> Pančić	Bal	End-15	MtC 1	Ch
<i>Hippocrepis comosa</i> L.	subMed	Subatl-Subm	MtC 1	H
<i>Lathyrus aphaca</i> L.	subBoreal	Pont-Subm	SCC 3	Th
<i>L. hirsutus</i> L.	Eur-Med	Subm	SCC 3	Th
<i>L. laxiflorus</i> (Desf.) Kuntze	subMed	is.Subm	MtC 1	H
<i>Lathyrus niger</i> (L.) Bernh.	Eur-Med	Subpont	MtC 1	H
<i>L. nissolia</i> L.	Eur-sMed	Subatl-Subm	MtC 2	H
<i>L. pallescens</i> (M. Bieb.) K. Koch	subMed	Pont-Pan	MtC 1	H
<i>L. pratensis</i> L.	subBoreal	Subevr	SC 2	H
<i>L. tuberosus</i> L.	Eur-As	Subj.sib	NCC 3	H
<i>L. venetus</i> (Mill.) Wohlf.	Eur-Med	Pont-is.Subm	MtC 1	H
<i>L. vernus</i> (L.) Bernh.	Eur-Sib	Subse	SC 1	H
<i>Lotus corniculatus</i> L.	Eur-Med	Subevr	SCC 3	H
<i>Medicago falcata</i> L.	Eur-As	Subpont-Ca	NCC 2	H
<i>M. lupulina</i> L.	Eur-As	Subevr	SCC 3	Th
<i>M. minima</i> (L.) Bartal.	Eur-As	Subpont-Subm	SCC 3	Th
<i>M. rigidula</i> (L.) All.	Eur-Med	Subm	SCC 3	Th
<i>M. sativa</i> L.	CAs (Adv)	Adv	Adv	H
<i>Melilotus officinalis</i> (L.) Pall.	Eur-As	Evr	SCC 3	Th
<i>Onobrychis alba</i> (Waldst. & Kit.) Desv.	subMed	Balk-c.j.Apen	MtC 1	H
<i>O. arenaria</i> (Kit.) DC.	sPont	Subpont	NCC 1	H
<i>Ononis adenotricha</i> Boiss.	Med	is.Subm	SCC 1	H
<i>O. pusilla</i> L.	subMed	Subm	MtC 1	H
<i>Trifolium alpestre</i> L.	Eur-Sib	Subpont-Ca	NCC 1	H
<i>T. campestre</i> Schreb.	Eur-Med	Subse	MtC 2	Th

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>T. hybridum</i> L.	Eur-Med	Subatl-Subm	MedC 3	H
<i>T. medium</i> L.	Eur-As	Subse	SC 2	H
<i>T. ochroleucon</i> Huds.	Eur	Subatl-Subm	MtC 2	H
<i>T. pratense</i> L.	subBoreal	Subevr	NCC 2	H
<i>T. repens</i> L.	Eur-Sib	Subevr	SCC 3	H
<i>Trigonella gladiata</i> M. Bieb.	subMed	Subm	MtC 1	G
<i>T. monspeliaca</i> L.	subMed	Subm	SCC 2	Th
<i>T. striata</i> L.	Pont-Bal	Subtaur	NCC 1	Th
<i>Vicia grandiflora</i> Scop.	Eur-Med	Pont-is.Subm	MtC 2	H
<i>V.onobrychioides</i> L.	Med	Subm	MtC 1	H
<i>V. pannonica</i> Crantz	Eur-Med	Pont-Ca-Subm	SCC 3	Th
<i>V. peregrina</i> L.	Eur-As	Pont-Subm	SCC 3	Th
<i>V. sativa</i> L.	Eur-Med	Subse	SCC 3	Th
<i>V. sepium</i> L.	Eur-As	Subse	SC 1	H
<b>Fagaceae</b>				
<i>Fagus sylvatica</i> L.	Eur	Se	MtC 1	Ph
<i>Quercus cerris</i> L.	Eur-subMed	is.Subm	MtC 1	Ph
<i>Q. dalechampii</i> Ten.	subMed	is.Subm	MtC 1	Ph
<i>Q. pubescens</i> Willd.	Eur-subMed	Subm	MedC 1	Ph
<b>Gentianaceae</b>				
<i>Centaurium erythraea</i> Rafn	subMed	Subse	SCC 2	Th
<i>Gentiana cruciata</i> L.	Eur-Sib	Subj.sib	SC 1	H
<b>Geraniaceae</b>				
<i>Erodium ciconium</i> (L.) L'Hér.	subMed	Subm	SCC 3	Th
<i>E. cicutarium</i> (L.) L'Hér.	subBoreal	Evr	SCC 3	Th
<i>Geranium columbinum</i> L.	subMed	Evr	SCC 3	Th
<i>G. dissectum</i> L.	Eur-As	Evr	SCC 3	Th
<i>G. lucidum</i> L.	Eur-As	Subatl-Subm	MtC 1	G
<i>G. molle</i> L.	Eur-Med	Subevr	SCC 3	Th
<i>G. phaeum</i> L.	Eur	Se	MtC 1	H
<i>G. pyrenaicum</i> Burm. f.	subMed	Subatl-Subm	MtC 1	H
<i>G. robertianum</i> L.	subBoreal	Subcirk	SC 1	Th
<i>G. sanguineum</i> L.	Eur	Subpont	MtC 1	H
<b>Globulariaceae</b>				
<i>Globularia aphyllanthes</i> Crantz	Eur	Se	NCC 1	H
<b>Hypericaceae</b>				
<i>Hypericum elegans</i> Stephan ex Willd.	Eur-Sib	Pont-Ca	NCC 1	H
<i>H. hirsutum</i> L.	Eur-Sib	Subevr	SC 1	H
<i>H. perforatum</i> L.	Kos	Subevr	SCC 3	H
<i>H. rumeliacum</i> Boiss.	Bal	Mez-Sk-Pind	MtC 1	H
<i>H. tetrapterum</i> Fr.	Eur-Sib	Evr	SCC 1	H
<b>Juglandaceae</b>				
<i>Juglans regia</i> L.	Eur-As/Paleo	Subiran-is.Subm	MtC 3	Ph
<b>Lamiaceae</b>				
<i>Acinos alpinus</i> (L.) Moench	Alp-Carp	Subm	MtC 1	H
<i>A. arvensis</i> (Lam.) Dandy	Eur-Med	Subpont	MtC 2	Th
<i>Ajuga chamaepytis</i> (L.) Schreb.	Pont-Med	Subatl-Subm	SCC 2	H
<i>A. genevensis</i> L.	sPont	Evr	NCC 2	H
<i>A. laxmanii</i> (L.) Benth.	sSib	Pont	MtC 1	H
<i>A. reptans</i> L.	Eur-Med	Subse	MtC 2	H
<i>Ballota nigra</i> L.	Eur-Med	Subpont	SCC 3	H
<i>Calamintha nepeta</i> (L.) Savi	Eur-Med	Pont-Subm	MtC 1	H

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>C. sylvatica</i> Bromf.	Eur-OT	Subm	SCC 2	H
<i>Clinopodium vulgare</i> L.	subBoreal	Cirk	MtC 2	H
<i>Glechoma hirsuta</i> Waldst. & Kit.	Eur-Med	Pont-is.Subm	MtC 1	H
<i>Hyssopus officinalis</i> L.	Eur-As	Subm	MtC 1	H
<i>Lamiaeum galeobdolon</i> (L.) Ehrend. & Polatschek	Med	Subse	MtC 1	H
<i>Lamium amplexicaule</i> L.	Eur-As	Subevr	SCC 3	Th
<i>L. maculatum</i> L.	subBoreal	Subse	MtC 1	H
<i>L. purpureum</i> L.	Eur-Med	Subse	SCC 3	Th
<i>Leonurus cardica</i> L.	Eur-As	Evr	SCC 3	Th
<i>Marrubium peregrinum</i> L.	subMed	Pont-Pan	NCC 2	H
<i>Mellitis melissophyllum</i> L.	Eur	Se	MtC 1	H
<i>Mentha spicata</i> L.	Eur	Subse	SCC 2	H
<i>Micromeria cristata</i> (Hampe) Griseb.	Bal-Anat	Submez	MtC 1	H
<i>Nepeta nuda</i> L.	Eur-As	Subpont	SCC 3	H
<i>Origanum vulgare</i> L.	Eur-As	Evr	MtC 2	H
<i>Phlomis tuberosa</i> L.	Eur-Sib	Pont-Ca	NCC 1	H
<i>Prunella grandiflora</i> (L.) Scholler	subMed	Subse	MtC 1	H
<i>P. laciniata</i> (L.) L.	Eur	Pont-Subm	NCC 2	H
<i>Prunella vulgaris</i> L.	Kos	Subevr	SC 2	H
<i>Salvia amplexicaulis</i> Lam.	Bal-Dac	Subm	NCC 2	H
<i>S. argentea</i> L.	Med	Subm	MtC 1	H
<i>S. nemorosa</i> L.	Eur-OT	Subpont	NCC 2	H
<i>S. pratensis</i> L.	Eur-Med	Subse	NCC 1	H
<i>S. sclarea</i> L.	Med-As	Pont-Subm	SCC 3	H
<i>S. verticillata</i> L.	subMed	Subpont-Subm	SCC 3	H
<i>Satureja montana</i> L.	Pont-Med	Subm	MtC 1	H
<i>Scutellaria columnae</i> All.	subMed	Subm	MtC 1	H
<i>Sideritis montana</i> L.	subMed	Pont-Ca	SCC 3	Th
<i>Stachys cassia</i> (Boiss.) Boiss.	Pont-Med	Subsk-Pind	MedC 1	H
<i>S. germanica</i> L.	Eur-subMed	Pont-Subm	NCC 3	H
<i>S. officinalis</i> (L.) Trevis.	subMed	Subse	NCC 2	H
<i>S. plumosa</i> Griseb.	Bal	End-15	MtC 1	G
<i>S. recta</i> L.	Eur-Med	Subpont	NCC 2	H
<i>S. sylvatica</i> L.	Eur-As	Subse	SC 1	H
<i>Teucrium chamaedrys</i> L.	subMed	Subpont-Subm	NCC 2	H
<i>T. montanum</i> L.	subMed	Subm	MtC 1	H
<i>T. polium</i> L.	Pont-Med	Pont-Subm	SCC 1	H
<i>Thymus callieri</i> Borb6s ex Velen.	Pont	Subpont	MtC 1	H
<i>T. pannonicus</i> All.	Eur	Pont-Pan	NCC 2	H
<i>T. striatus</i> Vahl	subMed	Srbalk-c.j.Apen	MtC 1	H
<i>Ziziphora capitata</i> L.	Med	is.Subm	SCC 2	Th
<b>Linaceae</b>				
<i>Linum austriacum</i> L.	subMed	Subpont-Subm	NCC 2	H
<i>L. capitatum</i> Kit. ex Schult.	Ap-Bal	Srbalk-Apen	MtC 1	H
<i>L. catharticum</i> L.	subBoreal	Subse	SC 2	Th
<i>L. hirsutum</i> L.	subMed	Pont-Pan	NCC 1	H
<i>L. nervosum</i> Waldst. & Kit.	subMed	Pont	NCC 1	H
<i>L. tauricum</i> Willd.	Pont-Med	Pont	NCC 1	H
<i>L. tenuifolium</i> L.	Pont-Med	Pont-Subm	NCC 1	H
<b>Lythraceae</b>				
<i>Lythrum salicaria</i> L.	subBoreal	Pont-Ca-Subm	SCC 3	H
<b>Malvaceae</b>				

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Alcea rosea</i> L.	Med	Adv	Adv	H
<i>Althaea hirsuta</i> L.	Med-As	Pont-Subm	MedC 2	Th
<i>Lavatera thuringiaca</i> L.	Pont-Sib	Pont-Ca	NCC 2	H
<i>Malva sylvestris</i> L.	Kos	Evr	SCC 3	Th
<b>Monotropaceae</b>				
<i>Monotropa hypopitys</i> L.	Boreal	Cirk	SC 1	G
<b>Oleaceae</b>				
<i>Fraxinus excelsior</i> L.	Eur-Med	Subse	MtC 1	Ph
<i>F. ornus</i> L.	subMed	Subm	MtC 1	Ph
<i>Ligustrum vulgare</i> L.	subMed	Subse	MtC 2	Ph
<i>Syringa vulgaris</i> L.	Carp-Bal	Mez-Dac	MtC 1	Ph
<b>Onagraceae</b>				
<i>Epilobium angustifolium</i> L.	subBoreal	Cirk	SC 1	H
<i>E. dodonaei</i> Vill.	Pont-Med	Se	MtC 1	H
<i>E. hirsutum</i> L.	Boreal	Subevr	NCC 2	H
<i>E. montanum</i> L.	Eur-OT	Evr	SC 2	H
<i>E. parviflorum</i> Schreb.	subBoreal	Subevr	SC 1	H
<b>Orobanchaceae</b>				
<i>Orobanche alba</i> Stephan ex Willd	Eur-Med	Evr	NCC 1	Th
<i>O. purpurea</i> Jacq.	Eur	Subpont-Subm	NCC 1	Th
<b>Papaveraceae</b>				
<i>Chelidonium majus</i> L.	Eur-As	Evr	NCC 3	H
<i>Corydalis bulbosa</i> (L.) DC.	Eur-Med	Subse	MtC 1	G
<i>C. marschalliana</i> (Pall.) Pers.	subMed	Subse	MtC 1	G
<i>C. solida</i> (L.) Schwarz	Eur-Med-CAs	Subse	SC 1	G
<i>Fumaria officinalis</i> L.	Eur-Sib	Subevr	SCC 3	Th
<i>Papaver rhoeas</i> L.	Eur-Sib	Subevr	SCC 3	Th
<b>Plantaginaceae</b>				
<i>Plantago argentea</i> Chaix	subMed	Subm	MtC 1	H
<i>P. lanceolata</i> L.	Kos	Evr	SCC 3	H
<i>P. major</i> L.	Boreal	Evr	SCC 3	H
<i>P. media</i> L.	Boreal	Evr	NCC 2	H
<i>P. subulata</i> L.	Med	Subm	MtC 1	H
<b>Polygalaceae</b>				
<i>Polygala major</i> Jacq.	Eur-Sib	Pont-is.Subm	MtC 1	H
<i>P. vulgaris</i> L.	Eur-Med	Evr	SC 2	H
<i>Bilderdykia convolvulus</i> (L.) Dumort.	Eur-As	Subevr	SCC 3	Th
<i>Polygonum aviculare</i> L.	Kos	Kosm	SCC 3	Th
<i>Rumex acetosa</i> L.	Boreal	Evr	SC 3	H
<i>R. acetosella</i> L.	Eur-subMed	Subcirk	SC 2	H
<i>R. conglomeratus</i> Murray	Eur-As	Subevr	SCC 2	H
<b>Primulaceae</b>				
<i>Anagallis arvensis</i> L.	Kos	Kosm	SCC 3	Th
<i>Lysimachia nummularia</i> L.	Eur	Subse	MtC 1	H
<i>Primula veris</i> L.	Eur-Med	Subse	SC 1	H
<i>P. vulgaris</i> Huds.	Eur	Subatl-Subm	MtC 1	H
<b>Ranunculaceae</b>				
<i>Actaea spicata</i> L.	Eur-As	Evr	SC 1	H
<i>Adonis flammea</i> Jacq.	Eur-subMed	Subpont-Subm	SCC 2	Th
<i>A. vernalis</i> L.	Eur-Sib	Pont-Ca	NCC 1	H
<i>Anemone nemorosa</i> L.	subBoreal	Cirk	SC 1	G
<i>A. ranunculoides</i> L.	Eur-subMed	Subse	SC 1	G

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>A. sylvestris</i> L.	Eur-As	Subpont-Ca	NCC 1	H
<i>Clematis integrifolia</i> L.	Eur-As	Pont-Ca	NCC 1	Ch
<i>C. recta</i> L.	subMed	Subpont-Ca	NCC 1	Ch
<i>Clematis vitalba</i> L.	Eur	Subatl-Subm	MtC 2	Ph
<i>Consolida regalis</i> Gray	Eur-Med	Subse	NCC 3	Th
<i>Helleborus odorus</i> Waldst. & Kit.	Eur-sMed	Srbalk	MtC 1	H
<i>Hepatica nobilis</i> Mill.	Eur-Sib	Cirk	SC 1	H
<i>Isopyrum thalictroides</i> L.	Eur	Subpont	MtC 1	G
<i>Nigella arvensis</i> L.	subMed	Subpont-Subm	MedC 3	Th
<i>Pulsatilla montana</i> (Hoppe) Rchb.	Eur	Subsrbalk	MtC 1	H
<i>Ranunculus acris</i> L.	Kos	Subj.sib	SC 2	H
<i>R. auricomus</i> L.	Eur-Med	Evr	SC 1	H
<i>R. ficaria</i> L.	Eur-Sib	Subse	SC 2	H
<i>R. illyricus</i> L.	Eur-subMed	Subpont	SCC 1	G
<i>R. millefoliatus</i> Vahl	subMed	is.Subm	MtC 1	G
<i>R. repens</i> L.	subMed	Evr	SC 2	H
<i>Thalictrum minus</i> L.	Eur-Sib	Evr	NCC 1	H
<b>Resedaceae</b>				
<i>Reseda lutea</i> L.	subBoreal	Subse	SCC 3	Th
<b>Rhamnaceae</b>				
<i>Rhamnus cathartica</i> L.	Eur-As	Subpont-Ca	SC 2	Ph
<i>R. saxatilis</i> Jacq.	Eur-Med	Subm	MtC 1	Ph
<b>Rosaceae</b>				
<i>Agrimonia eupatoria</i> L.	Eur-Med	Evr	SC 3	H
<i>Amelanchier ovalis</i> Medic.	Pont-Med	Subm	MtC 1	Ph
<i>Amygdalus nana</i> L.	Eur-As	Pont-Ca	NCC 1	Ph
<i>Aremonia agrimonoides</i> (L.) DC.	subMed	is.Subm	MtC 1	H
<i>Cotoneaster integerrimus</i> Medik.	Eur-Sib	Subj.sib	MtC 1	Ph
<i>C. nebrodensis</i> (Guss.) K. Koch	subMed	Subm	MtC 1	Ph
<i>Crataegus monogyna</i> Jacq.	subBoreal	Subse	MtC 2	Ph
<i>Filipendula vulgaris</i> Moench	Eur-Med	Evr	NCC 2	H
<i>Fragaria vesca</i> L.	subBoreal	Evr	SC 2	H
<i>Geum urbanum</i> L.	subBoreal	Evr	SC 2	H
<i>Malus sylvestris</i> Mill.	Eur	Subse	MtC 1	Ph
<i>Potentilla argentea</i> L.	sPont	Subpont-Ca	SC 2	H
<i>P. cinerea</i> Chaix ex Vill.	Eur	Subse	NCC 1	H
<i>P. micrantha</i> Ramond ex DC.	Eur-subMed	Subm	MtC 1	H
<i>P. mollicrinis</i> (Borb6s) Stankov	Pont-Med	Subtaur	NCC 1	H
<i>P. obscura</i> Willd.	Eur	Subpont-CA	NCC 2	H
<i>P. pedata</i> Willd.	Med	is.Subm	SCC 2	H
<i>P. reptans</i> L.	Kos	Evr	SCC 2	H
<i>Prunus avium</i> L.	subMed	Subse	MtC 1	Ph
<i>P. cerasifera</i> Ehrh.	Eur-As	Subj.sib	NCC 3	Ph
<i>P. spinosa</i> L.	sPont	Subpont	SCC 3	Ph
<i>Pyrus nivalis</i> Jacq.	Eur-As	is.Subm	MedC 1	Ph
<i>P. pyraeaster</i> Burgsd.	subMed	Subse	MtC 1	Ph
<i>Rosa canina</i> L.	subMed	Subse	SC 2	Ph
<i>R. dumalis</i> Bechst.	Eur-As	Evr	SC 1	Ph
<i>R. gallica</i> L.	Eur-Med	Subpont-Ca-Subm	MtC 2	Ph
<i>R. myriacantha</i> DC. ex Lam. & DC.	subMed	Subse	NCC 2	Ph
<i>R. pendulina</i> L.	subMed	Se	MtC 1	Ph
<i>R. pimpinellifolia</i> L.	subMed	Subse	NCC 2	Ph



## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Rubus caesius</i> L.	Eur-As	Subj.sib	SC 2	Ph
<i>R. canescens</i> DC.	Eur-Med	Pont-Subm	MtC 2	Ph
<i>R. discolor</i> Weihe & Nees	subMed	Se	MtC 1	Ph
<i>Sanguisorba minor</i> Scop.	subBoreal	Subevr	SCC 2	H
<i>Sorbus aria</i> (L.) Crantz	Eur	Se	MtC 1	Ph
<i>S. domestica</i> L.	Eur-Med	Subm	MtC 1	Ph
<i>S. torminalis</i> (L.) Crantz	Pont-Med	Subatl-Subm	MtC 1	Ph
<i>Waldsteinia geoides</i> Willd.	Pann-Bal	Mez-Subdac	MtC 1	H
<b>Rubiaceae</b>				
<i>Asperula cynanchica</i> L.	Eur-Med	Subpont-Subm	MtC 2	H
<i>A. purpurea</i> (L.) Ehrend.	subMed	Subm	MtC 1	H
<i>A. taurina</i> L.	Pont-Med	Subpan	MtC 1	H
<i>A. tenella</i> Heuff. ex Degen	subMed	Subm	MtC 1	H
<i>Crucianella angustifolia</i> L.	Med	Subm	MtC 1	Th
<i>C. graeca</i> Boiss.	Bal	Subsk-Pind	MtC 1	Th
<i>Cruciata glabra</i> (L.) Ehrend.	sMed-CAs	Pont-Subm	MtC 1	H
<i>C. laevipes</i> Opiz	sMed-CAs	Subse	SC 1	H
<i>Galium album</i> Mill.	Eur-As	Subse	NCC 2	H
<i>G. aparine</i> L.	Eur-As	Evr	NCC 1	H
<i>G. flavescens</i> Borb6s	Bal-Dac	Subsrbalk	MtC 1	H
<i>G. glaucum</i> L.	subMed	Subpont	NCC 1	H
<i>G. heldreichii</i> Hal.	Bal-Anat	Submez	MtC 1	H
<i>G. lucidum</i> All.	subMed	Subm	NCC 2	H
<i>G. odoratum</i> (L.) Scop.	Eur-As	Subevr	SC 1	H
<i>G. pseudaristatum</i> Schur	Pann-Bal	Submez-Subpan	MtC 1	H
<i>G. spurium</i> L.	Eur-As	Evr	NCC 3	H
<i>G. verum</i> L.	Eur-As	Evr	NCC 2	H
<i>Sherardia arvensis</i> L.	Med	Kosm	SCC 3	Th
<b>Rutaceae</b>				
<i>Dictamnus albus</i> L.	Eur-As	Subpont-Subca-Subm	NCC 1	H
<i>Haplophyllum suaveolens</i> (DC.) G. Don	Med	Pont	NCC 1	H
<b>Salicaceae</b>				
<i>Populus tremula</i> L.	subBoreal	Subevr	SC 1	Ph
<i>Salix caprea</i> L.	subBoreal	Evr	SC 1	Ph
<b>Santalaceae</b>				
<i>Comandra elegans</i> (Roch. ex Rchb.) Rchb. f.	Bal-Dac-Anat	Subdac	MtC 1	H
<i>Thesium arvense</i> Horv.	Med-CAs	Subevr	NCC 2	H
<i>T. bavarum</i> Schrank	subMed	Se	MtC 1	H
<i>T. divaricatum</i> Jan ex Mert. & W.D.J. Koch	Eur-Med	Subm	MedC 1	H
<b>Saxifragaceae</b>				
<i>Ribes uva-crispa</i> L.	subMed	Subevr	MtC 1	Ph
<b>Scrophulariaceae</b>				
<i>Digitalis grandiflora</i> Mill.	Eur-Sib	Subse	MtC 1	H
<i>D. lanata</i> Ehrh.	subMed	Subbalk	MtC 2	H
<i>Euphrasia hirtella</i> Jord. ex Reut.	Eur-As	Evr	NCC 1	Th
<i>E. pectinata</i> Ten.	subMed	Pont-Subm	NCC 1	H
<i>Lathraea squamaria</i> L.	Eur-As	Subse	SC 1	G
<i>Linaria dalmatica</i> (L.) Mill.	Med	Srbalk-j.Apen	MtC 1	H
<i>L. genistifolia</i> (L.) Mill.	Pont-Sib	Pont-Pan	SCC 3	H
<i>L. vulgaris</i> Mill.	Eur-Sib	Subse	SCC 3	H
<i>Melampyrum arvense</i> L.	Eur-Med	Subse	SCC 3	Th
<i>M. cristatum</i> L.	Eur-Sib	Subse	SC 2	Th

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Odontites glutinosa</i> (M. Bieb.) Benth.	Pont-Med	Subsk-Pind	MtC 1	Th
<i>O. lutea</i> (L.) Clairv.	Eur	Pont-Subm	NCC 1	Th
<i>O. serotina</i> (Lam.) Dumort.	Eur	Subse	NCC 3	Th
<i>Pedicularis petiolaris</i> Ten.	Ap-Bal	Subend	MtC 1	H
<i>Rhinanthus rumelicus</i> Velen.	Eur-Med	Subsbalk	SCC 2	Th
<i>Scrophularia canina</i> L.	Eur-Med	Subm	SCC 1	H
<i>Verbascum banaticum</i> Schrad.	Bal-Dac	Submez-Subdac	MtC 2	H
<i>V. chaixii</i> Vill.	Pann-Bal	Subpan	MtC 1	H
<i>V. phoeniceum</i> L.	Eur-Sib	Subpont	NCC 2	H
<i>V. speciosum</i> Schrad.	Eur-Med	Subeuks	MtC 1	H
<i>V. urumovii</i> Stoj. & Acht.	Bul	End-6	MtC 1	H
<i>V. austriaca</i> L.	Eur-Med	Subpont-Subm	MtC 1	H
<i>V. barrelieri</i> Roem. & Schult.	Pont-Bal	Pont-Ca	NCC 1	H
<i>V. chamaedrys</i> L.	Eur-As	Subse	SC 2	H
<i>V. hederifolia</i> L.	Eur-Med	Subse	SCC 3	Th
<i>V. officinalis</i> L.	Eur-Sib	Subbor-Cirk	SC 1	H
<i>V. orchidea</i> Crantz	Eur	Subpan	NCC 1	H
<i>V. prostrata</i> L.	Eur	Evr	NCC 1	H
<i>V. teucrium</i> L.	Eur-Sib	Evr	SC 1	H
<b>Staphyleaceae</b>				
<i>Staphylea pinnata</i> L.	Eur-Med	Subeuks	MtC 1	Ph
<b>Thymelaeaceae</b>				
<i>Daphne cneorum</i> L.	subMed	Se	MtC 1	Ph
<i>Thymelaea passerina</i> (L.) Cosson & Germ.	Pont	Pont-Ca	SCC 2	Th
<b>Tiliaceae</b>				
<i>Tilia cordata</i> Mill.	Eur	Subse	SC 1	Ph
<i>T. platyphyllos</i> Scop.	Eur	Se	MtC 1	Ph
<b>Ulmaceae</b>				
<i>Ulmus glabra</i> Huds.	Eur-Med	Subse	SC 1	Ph
<i>U. minor</i> Mill.	Eur-Med	Subm	SCC 1	Ph
<b>Urticaceae</b>				
<i>Parietaria officinalis</i> L.	Eur	Subm	MedC 3	H
<i>Urtica dioica</i> L.	Boreal	Evr	NCC 3	H
<b>Valerianaceae</b>				
<i>Valerianella coronata</i> (L.) DC.	Eur-Med	Subm	SCC 3	Th
<b>Verbenaceae</b>				
<i>Verbena officinalis</i> L.	Kos	Kosm	SCC 3	H
<b>Violaceae</b>				
<i>Viola arvensis</i> Murray	Eur	Evr	SCC 3	Th
<i>V. hirta</i> L.	Eur-As	Subj.sib	MtC 1	H
<i>V. kitaibeliana</i> Schult.	Eur-Med	Subpont-Subm	SCC 3	Th
<i>V. mirabilis</i> L.	Eur-As	Evr	SC 1	H
<i>V. odorata</i> L.	Eur-Med	Subatl-Subm	MtC 1	H
<i>V. reichenbachiana</i> Jord. ex Bureau	Eur-As	Se	SC 1	H
<i>V. riviniana</i> Rchb.	subMed	Subse	MtC 1	H
<i>V. tricolor</i> L.	Eur-As	Evr	SCC 3	Th
<b>Liliopsida</b>				
<b>Amaryllidaceae</b>				
<i>Galanthus elwesii</i> Hook. f.	Eur	Se	MtC 1	G
<i>Sternbergia colchiciflora</i> Waldst. & Kit.	Eur-Pont	Pont-is.Subm	MtC 1	G
<b>Araceae</b>				

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Arum maculatum</i> L.	Eur-subMed	Se	MtC 1	G
<b>Cyperaceae</b>				
<i>Carex caryophyllea</i> Latourr.	Boreal	Evr	SC 2	H
<i>C. digitata</i> L.	Eur-Sib	Subse	SC 1	H
<i>C. halleriana</i> Asso	Eur-As	Subevr	MtC 1	H
<i>C. humilis</i> Leys.	Eur-As	Subj.sib	NCC 1	H
<i>C. liparocarpos</i> Gaudin	Pont-Med	Pont-Ca	MtC 1	H
<i>C. michelii</i> Host	Eur	Subeuks	MtC 1	H
<i>C. montana</i> L.	Eur-Sib	Subse	SC 1	H
<i>C. pilosa</i> Scop.	Eur-As	Evr	MtC 1	H
<i>C. praecox</i> Schreb.	Eur-Sib	Evr	NCC 2	H
<i>C. sylvatica</i> Huds.	subMed	Subcirk	SC 1	H
<i>C. tomentosa</i> L.	Eur-Sib	Subj.sib	MtC 1	H
<b>Iridaceae</b>				
<i>Crocus biflorus</i> Mill.	Med	Balk-Apen	MtC 1	G
<i>C. flavus</i> Weston	Eur-Pont	Mez-Dac	MtC 1	G
<i>C. olivieri</i> J. Gay	Bal	Balk	MtC 1	G
<i>Gladiolus imbricatus</i> L.	Eur-sMed	Subpont	SC 1	G
<i>Iris graminea</i> L.	Pont-Med	Pont-Subm	MtC 1	H
<i>I. pumila</i> L.	subMed	Pont-Ca	NCC 1	H
<i>I. reichenbachii</i> Heuff.	Bal-Dac	Submez	MtC 1	H
<i>I. variegata</i> L.	subMed	Pont-Pan	MtC 1	H
<b>Juncaceae</b>				
<i>Juncus inflexus</i> L.	subBoreal	Subcirk	SCC 2	H
<i>Luzula forsteri</i> (Sm.) DC.	Boreal	Subatl-Subm	MtC 1	H
<i>L. luzuloides</i> (Lam.) Dandy	Eur	Se	MtC 2	H
<b>Liliaceae</b>				
<i>Allium albidum</i> Fisch. ex M. Bieb.	Eur-Sib	Pont-Ca	NCC 1	G
<i>A. carinatum</i> L.	Pont-Med	Subeuks	MtC 1	G
<i>A. cupani</i> Rafin.	Med	is.Subm	MtC 1	G
<i>A. flavum</i> L.	Med	Pont-Ca-Subm	NCC 2	G
<i>A. moschatum</i> L.	Pont-subMed	Pont-Subm	NCC 1	G
<i>A. nigrum</i> L.	subMed	Subm	SCC 3	G
<i>A. rotundum</i> L.	Eur-OT	Pont-Subm	SCC 2	G
<i>A. scorodoprasum</i> L.	Eur-Med	Se	NCC 3	G
<i>A. ursinum</i> L.	Eur	Se	SC 1	G
<i>Anthericum liliago</i> L.	subMed	Subatl-Subm	MtC 1	H
<i>A. ramosum</i> L.	Eur	Subpont	NCC 1	H
<i>Asparagus officinalis</i> L.	Eur	Subpont	SCC 3	H
<i>A. tenuifolius</i> Lam.	Pont-Med	Subm	MtC 1	G
<i>Asphodeline liburnica</i> (Scop.) Rchb.	Pont-Med	is.Subm	MedC 1	G
<i>A. taurica</i> (Pall. ex M. Bieb.) Kunth.	Pont-Med	Pont-Subm	MtC 1	G
<i>Colchicum autumnale</i> L.	Eur	Se	MtC 2	G
<i>Convallaria majalis</i> L.	Boreal	Cirk	SC 1	G
<i>Erythronium dens-canis</i> L.	Med	Subm	MtC 1	G
<i>Fritillaria orientalis</i> Adams.	subMed	Pont-Pan	MtC 1	G
<i>Gagea lutea</i> (L.) Ker-Gawl.	Eur-As	Evr	SC 1	G
<i>Hyacinthella leucophaea</i> (Steven ex Kunth.) Schur	Pont-Med	Pont	NCC 1	G
<i>Lilium martagon</i> L.	Eur-As	Evr	SC 1	G
<i>Muscari botryoides</i> (L.) Mill.	Med	Pont-Subm	MtC 1	G
<i>M. neglectum</i> Guss. ex Ten.	Med-OT	Subm	SCC 3	G
<i>M. tenuiflorum</i> Tausch	Pont-Med	Pont-Pan	NCC 2	G

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Ornithogalum narbonense</i> L.	Med	Subm	SCC 3	G
<i>O. pyrenaicum</i> L.	Med	Subatl-Subm	MtC 1	G
<i>O. sibthorpii</i> Greuter	Bal-Anat	Subeuks	MedC 2	G
<i>O. umbellatum</i> L.	Pont-subMed	Subse	SCC 3	G
<i>Polygonatum latifolium</i> (Jacq.) Desf.	Boreal	Subpont-Subpan	MtC 1	G
<i>P. odoratum</i> (Mill.) Druce	Eur-Sib	Subj.sib	SC 1	G
<i>Scilla bifolia</i> L.	Pont-subMed	Subatl-Subm	MtC 1	G
<i>Tulipa urumoffii</i> Hayek	Bul	End-6	MtC 1	G
<i>Veratrum nigrum</i> L.	Eur-As	Evr	MtC 1	H
<b>Orchidaceae</b>				
<i>Cephalanthera damasonium</i> (Mill.) Druce	subMed	Subse	MtC 1	H
<i>Coeloglossum viride</i> (L.) Hartm.	Boreal	Cirk	SC 1	G
<i>Epipactis purpurata</i> Sm.	subBoreal	Subevr	SC 1	H
<i>Gymnadenia conopsea</i> (L.) R. Br.	Eur-As	Evr	SC 1	G
<i>Himantoglossum caprinum</i> (M. Bieb.) Spreng.	Med	Subatl-Subm	MedC 1	G
<i>Limodorum abortivum</i> (L.) Sw.	Med	Subm	MedC 1	G
<i>Neottia nidus-avis</i> (L.) Rich.	Eur-As	Subse	SC 1	G
<i>Ophrys apifera</i> Huds.	Eur	Subatl-Subm	NCC 1	G
<i>O. cornuta</i> Steven	Bal-Anat	Subeuks	MedC 1	G
<i>O. insectifera</i> L.	Eur	Se	NCC 1	G
<i>Orchis morio</i> L.	Eur-subMed	Subse	SC 1	G
<i>O. pallens</i> L.	sPont	Subm	MtC 1	G
<i>O. pinetorum</i> Boiss. & Kotschy	subMed	Subse	SC 1	G
<i>O. purpurea</i> Huds.	subMed	Subatl-Subm	MtC 1	G
<i>O. simia</i> Lam.	subMed	Subatl-Subm	MtC 1	G
<i>O. tridentata</i> Scop.	Eur-subMed	Subm	MedC 1	G
<i>O. ustulata</i> L.	Eur-Sib	Subse	SC 1	G
<i>Platanthera chlorantha</i> (Custer) Rchb.	Eur-Sib	Evr	SC 1	G
<b>Poaceae</b>				
<i>Aegilops neglecta</i> Req. ex Bertol	subMed	Subm	SCC 3	Th
<i>A. triuncialis</i> L.	Eur-As	Subm	SCC 3	Th
<i>Agropyron cristatum</i> (L.) Gaertn.	Eur-Pont	Evr	NCC 1	H
<i>Agrostis capillaris</i> L.	Boreal	Cirk	SC 2	H
<i>Alopecurus pratensis</i> L.	Eur-As	Evr	SC 2	H
<i>Anthoxanthum odoratum</i> L.	Eur-As	Subevr	SC 2	H
<i>Apera spica-venti</i> (L.) P. Beauv.	subBoreal	Evr	MedC 3	Th
<i>Arrhenatherum elatius</i> (L.) P. Beauv. ex J. Presl & C. Presl	Eur-As	Subse	MtC 3	H
<i>Avenula pubescens</i> (Huds.) Dumort.	sSib	Evr	NCC 1	H
<i>Brachypodium pinnatum</i> (L.) P. Beauv.	sSib	Subj.sib	SC 1	H
<i>B. sylvaticum</i> (Huds.) P. Beauv.	Eur-As	Subj.sib	SC 2	H
<i>Briza media</i> L.	Eur	Evr	SC 1	H
<i>Bromus benekenii</i> (Lange) Trimen	Eur-As	Subevr	SC 1	H
<i>B. inermis</i> Leyss.	Eur-As	Evr	SC 1	H
<i>B. japonicus</i> Thunb.	Med-CAs	Subm	SCC 3	Th
<i>B. moesiacus</i> Velen.	Bul	End-6	MtC 1	H
<i>B. mollis</i> L.	Boreal	Subm	MedC 3	Th
<i>B. ramosus</i> Huds.	subMed-As	Subevr	SC 1	H
<i>B. squarrosus</i> L.	subMed	Subm	SCC 3	Th
<i>B. sterilis</i> L.	Boreal	Subevr	SCC 3	Th
<i>Catabrosa aquatica</i> (L.) P. Beauv.	Boreal	Cirk	SC 2	H
<i>Chrysopogon gryllus</i> (L.) Trin.	Pont-Med	Pont-Ca-Subm	SCC 2	H
<i>Cleistogenes serotina</i> (L.) Keng	Eur-subMed	Subm	NCC 1	H

## Supplement 1. Floristic list – continuation.

1	2	3	4	5
<i>Cynodon dactylon</i> (L.) Pers.	Kos	Kosm	SCC 3	H
<i>Cynosurus cristatus</i> L.	Eur	Subse	SC 2	H
<i>C. echinatus</i> L.	subMed	Subatl-Subm	MedC 3	Th
<i>Dactylis glomerata</i> L.	Eur-As	Subevr	SC 2	H
<i>Dasyphyrum villosum</i> (L.) P. Candargy	subMed	Subm	MedC 3	Th
<i>Deschampsia caespitosa</i> (L.) P. Beauv.	Boreal	Subcirk	SC 2	H
<i>Dichanthium ischaemum</i> (L.) Roberty	sMed-As	Pont-Ca-Subm	SCC 2	H
<i>Elymus caninus</i> (L.) L.	Boreal	Cirk	SC 1	H
<i>E. repens</i> (L.) Gould	Boreal	Evr	SC 2	H
<i>Festuca heterophylla</i> Lam.	Boreal	Se	MtC 1	H
<i>F. valesiaca</i> Schleich. ex Gaudin	Pont	Evr	NCC 2	H
<i>Hierochloa repens</i> (Host.) P. Beauv.	Boreal	Cirk	SC 1	H
<i>Holcus lanatus</i> L.	Eur	Evr	SC 1	H
<i>Hordeum murinum</i> L.	Boreal	Subm	SCC 3	Th
<i>Koeleria macrantha</i> (Ledeb.) Schult.	Eur	Cirk	NCC 2	H
<i>K. nitidula</i> Velen.	Pont	Subeuks	MtC 1	H
<i>Lolium perenne</i> L.	Eur-As	Subse	SC 2	H
<i>Melica ciliata</i> L.	Eur-subMed	Subm	NCC 1	H
<i>M. nutans</i> L.	Eur-As	Evr	SC 1	H
<i>M. uniflora</i> Retz.	Eur	Se	MtC 1	H
<i>Phleum pratense</i> L.	Eur-subMed	Subevr	SC 2	H
<i>Piptatherum virescens</i> (Trin.) Boiss.	Med	Iran-Euks	MtC 1	H
<i>Poa badensis</i> Haenke ex Willd.	Eur-As	Se	MtC 1	H
<i>P. bulbosa</i> L.	Eur-As	Subevr	NCC 2	H
<i>P. compressa</i> L.	Eur-subMed	Subse	NCC 2	H
<i>P. nemoralis</i> L.	Boreal	Cirk	SC 2	H
<i>P. pratensis</i> L.	Kos	Subcirk	SC 2	H
<i>P. trivialis</i> L.	Boreal	Subevr	SC 2	H
<i>Sesleria latifolia</i> (Adamovic) Degen	Bal	Mez	MtC 1	H
<i>S. rigida</i> Heuff. ex Rchb.	Carp-Bal	Mez-Karp	MtC 1	H
<i>Stipa capillata</i> L.	Pont-Med	Subpont-Ca-Subm	NCC 1	H
<i>S. epilosa</i> Martinovskø	Pont-Med	Subpont-Subm	NCC 1	H
<i>Vulpia myuros</i> (L.) C.C. Gmel.	subBoreal	Kosm	SCC 3	Th

\*For abbreviations see Tables 4 - 8

## References

- Apostolova-Stoyanova, N., Pavlov, D. & Dimitrov, M. 2005. Study on the syntaxonomic diversity of vegetation in northwestern parts of the Golo Burdo Mountain. – In: Brezin, V., Tassev, G., Panayotov, P., Zdravkova-Milusheva, M. & Krasteva, A. (eds), Proc. Natl. Conf. Young Sci., 2005. Pp 26-31. Univ. Forestry Press, Sofia (in Bulgarian).
- Assyov, B. & Petrova, A. (eds). 2006. Conspectus of the Bulgarian Vascular Flora. Distribution Maps and Floristic Elements. Ed. 3. BBF, Sofia.
- Biological Diversity Act. 2002. Decree no. 283 accepted by the 39<sup>th</sup> National Assembly on 02 August 2002. – Durzhaven Vestnik, no. 77/09.08.2002. Pp. 9-42 (in Bulgarian).
- Biological Diversity Act (Act on Amending and Supplementing). 2007. Decree no. 354 accepted by the 40<sup>th</sup> National Assembly on 01 November 2007. – Durzhaven Vestnik, no. 94/16.11.2007. Pp. 2-44 (in Bulgarian).
- Bondev, I. 2002. Geobotanic regioning. – In: Koprarev, I. (ed.), Geography of Bulgaria. Physical Geography. Socio-Economic Geography. Pp. 336-352. ForCom, Sofia (in Bulgarian).
- Boros, Á. 1968. Bryogeographie und Bryoflora Ungarns. Akad. Kiadó, Budapest.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora. Appendices. <http://www.cites.org/eng/app/appendices.shtml> (access: 11.11.2009).
- Delipavlov, D. & Cheshmedzhiev, I. (eds). 2003. Key to the Plants of Bulgaria. Agrarian Univ. Acad. Press, Plovdiv (in Bulgarian).
- Directive 92/43/EEC. Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora. – OJ L 206, 22.07.1992. Pp. 7-50.
- Donov, V. 1993. Forest Soil Science. Martilen Press, Sofia (in Bulgarian).

- Gajić, M.** 1980. Survey of the species of SR of Serbia with short marks of phytogeographical belonging. – Glasn. Šumarsk. Fak. Univ. Beogradu, C, Pejzazna Arhit., **54**: 111-141 (in Serbian).
- Gajić, M.** 1984. Floristic elements of SR Serbia. – In: **Sarić, M.** (ed.), Vegetation of Serbia. Ed. 1. Serbian Acad. Sci. & Arts, Belgrade, pp. 317-397 (in Serbian).
- Ganeva, A. & Natcheva, P.** 2003. Check-list of the bryophytes of Bulgaria with data on their distribution. I. *Hepaticae* and *Anthocerotae*. – Cryptog. Bryol., **24**(3): 229-239.
- Jakucs, P.** 1961. Die phytocoenologischen Verhältnisse der Flaumeichen Buschwälder Südostmitteleuropas. Akad. Kiado. Verlag. Der Ungar. Akad. Der Wissensch. Budapest
- Jordanov, D.** (ed.). 1963–1979. Flora Reipublicae Popularis Bulgariae. Vols 1-7. In Aedibus Acad. Sci. Bulgariae, Serdicae (in Bulgarian).
- Kozhuharov, S.** (ed.). 1992. Field Guide to the Vascular Plants in Bulgaria. Nauka & Izkustvo, Sofia (in Bulgarian).
- Kozhuharov, S.** (ed.). 1995. Flora Reipublicae Bulgariae. Vol. 10. Editio Acad. "Prof. Marin Drinov", Serdicae (in Bulgarian).
- Natcheva, R. & Ganeva, A.** 2005. Check-list of the bryophytes of Bulgaria. II. Musci. – Cryptog. Bryol., **26**(2): 209-232.
- Nikolov, V. & Yordanova, M.** 2002. Mountains of Bulgaria. Ed. 2. Editio Acad. "Prof. Marin Drinov", Serdicae (in Bulgarian).
- Pavlov, D. & Dimitrov, M.** 2002. Systematic analysis of the flora of maintained reserve "Ostrica" in Golo Bardo mountain. – Lesovudska Misal, **1-2**: 3-23 (in Bulgarian).
- Pavlov, D. & Dimitrov, M.** 2004. Study of the syntaxonomic diversity of vegetation in the Ostrica Maintained Reserve. – Lesovudska Misal, **1**: 50-57 (in Bulgarian).
- Petrov, S.** 1975. Bryophyta Bulgariae. Clavis diagnostica. In Aedibus Acad. Sci. Bulgariae, Serdicae (in Bulgarian).
- Petrova, A. & Vladimirov, V.** (eds). 2009. Red List of Bulgarian vascular plants. – Phytol. Balc. **15**(1): 63-94.
- Raunkiaer, C.** 1934. The Life Forms of Plants and Statistical Plant Geography. Oxford Univ. Press, Oxford.
- Stanev, S.** 1965. Floristic materials from the Mt Golo Burdo, Southwest Bulgaria. – Izv. Bot. Inst. (Sofia), **15**: 279-280 (in Bulgarian).
- Stefanov, B.** 1943. Phytogeographische Elemente in Bulgarien. – Sborn. Bulg. Akad. Nauk., **39**: 1-509 (in Bulgarian).
- Stojanov, N. & Ahtarov B.** 1951. Vegetation on the Mt Golo Bardo in West Bulgaria. – Dokl. Bulg. Akad. Nauk., **60**(1): 21-23 (in Russian).
- Tolmachev, A.** 1974. Introduction to Plant Geography. Leningrad Univ. Press, Leningrad (in Russian).
- Urumov, I.** 1935. The flora of the Kyustendil District. – Sborn. Bulg. Akad. Nauk., **30**: 1-235 (in Bulgarian).
- Valev, S.** 2002. Climatic regioning. – In: **Koprarev, I.** (ed.), Geography of Bulgaria. Physical Geography. Socio-Economic Geography. Pp. 155-156. ForCom, Sofia (in Bulgarian).
- Vasilev, P.** 1973. New and rare plants for the flora of Golo Bardo mountain. – Izv. Bot. Inst. (Sofia), **23**: 229-233 (in Bulgarian).
- Vasilev, P.** 1981. The Ostritsa Botanical Reserve in the Golo Bardo mountain near Pernik. – In: Reports. Regional Symp., Project 8-MAB, UNESCO, Blagoevgrad. Pp.: 205-217 (in Bulgarian).
- Vasilev, P. & Andreev, N.** 1978. Vegetation floristic analysis of the Ostritsa Reserve on the Mt Golo Bardo. – Fitologiya, **9**: 41-51 (in Bulgarian).
- Vasilev, P. & Andreev, N.** 1983. Phytogeographic elements in the flora of Mt Golo Bardo. – In: Reports. – Int. Symp. Project 6-MAB, UNESCO, Vratsa. Vol. 1: 77-83 (in Bulgarian).
- Vasilev, P. & Andreev, N.** 1992. Analysis of the flora of the Mt Golo Bardo. – Fitologiya, **42**: 3-21 (in Bulgarian).
- Velchev, V.** (ed.). 1982, 1989. Flora Reipublicae Popularis Bulgariae. Vols 8-9. In Aedibus Acad. Sci. Bulgariae, Serdicae (in Bulgarian).
- Vihodtsevki, N.** 1968. The Ostritsa Botanical Reserve, Mt Golo Bardo. – Sborn. Our Reserves and Natural Landscapes. Nauka & Izkustvo, Sofia (in Bulgarian).
- Walter, K. S. & Gillet, H. J.** 1998. 1997 IUCN Red List of Threatened Plants. Compiled by the World Conservation Monitoring Centre. IUCN. – The World Conservation Union, Gland, Switzerland & Cambridge.
- Yordanova, M.** 2002. Hydrological regioning. – In: **Koprarev, I.** (ed.), Geography of Bulgaria. Physical Geography. Socio-Economic Geography. Pp. 242-246. ForCom, Sofia (in Bulgarian).
-